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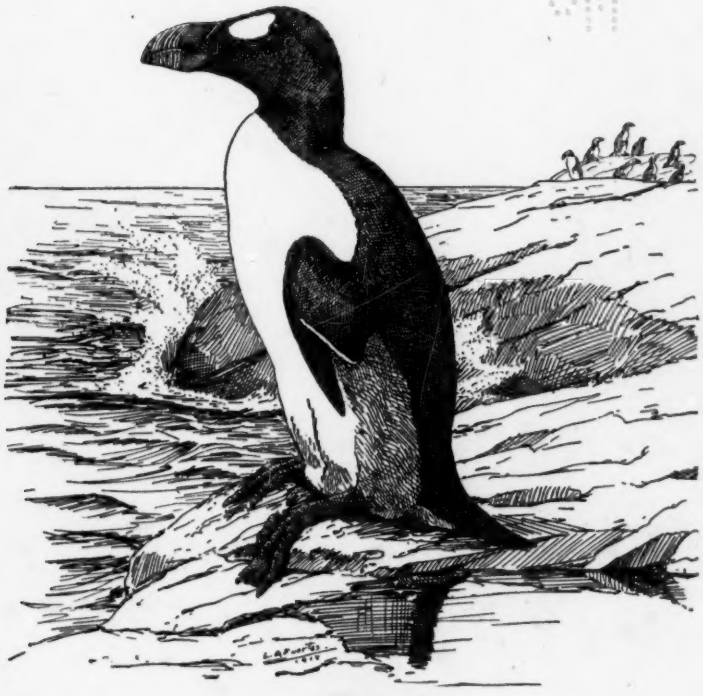
The Auk

A Quarterly Journal of Ornithology

EDITOR
WITMER STONE



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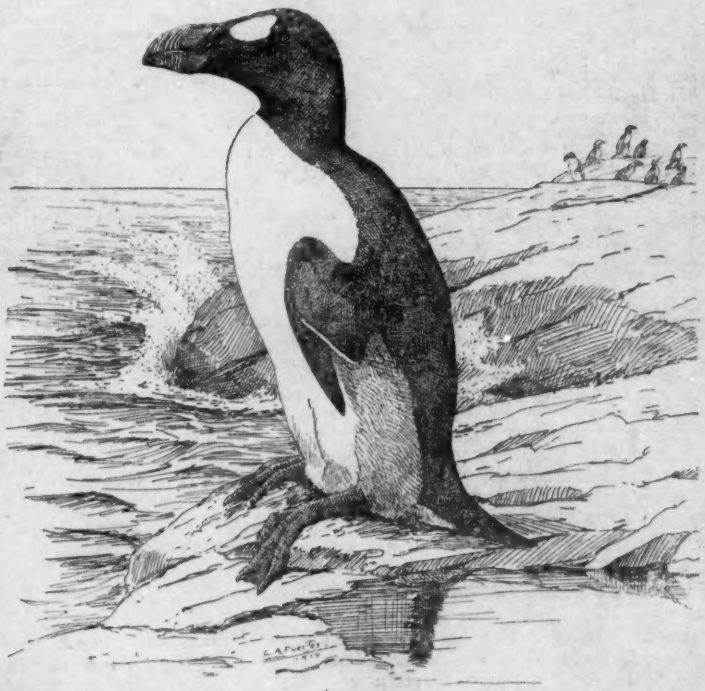

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NESTS OF THE TENNESSEE WARBLER (*Vermivora peregrina*).

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VOL. XXXIII. JANUARY, 1916. No. 1.

THE TENNESSEE WARBLER IN NEW BRUNSWICK.

BY B. S. BOWDISH AND P. B. PHILIPP.

Plate I.

DURING an expedition made by Messrs. T. F. Wilcox and P. B. Philipp to northern New Brunswick in 1914, two male Tennessee Warblers (*Vermivora peregrina*) were secured in breeding condition. No females were taken and no nests were found, but the birds were believed to have certainly been breeding, both because of the condition of the specimens taken, and the persistence of the males in remaining day after day in or about the small areas where they were first noted.

In June, 1915, a visit was made by the authors to the same locality for the purpose of obtaining data as to the breeding habits of the species. The number of nests found and the consequent amount of breeding data collected are thought sufficient to warrant the publication of the present notes, especially in view of the meagreness of the published accounts of the breeding habits of this none too common bird.

The region in question is particularly well adapted to the nesting requirements of the Tennessee Warbler, as we noted them during the above period. Extensive lumbering has removed the greater part of the large growth spruce and balsam timber, which forms the great bulk of the forests of this region, leaving areas of small trees, which, in the older clearings, have grown thickly, and to an

average height of ten feet. These are interspersed with areas of more or less open, large timber, and others where the second growth has reached little more than the proportions of somewhat scattered shrubbery. The essentially level surface is frequently scored by slight depressions which form the beds of tiny streams, bordered on either side by boggy ground, dotted with grass tussocks, bushes and small trees, and overspread with a luxuriant growth of moss. Such areas are most numerous in cleared tracts, but not infrequent in the edges and the more open portions of the woods. These are the summer home-sites of the Tennessee Warbler.

While it was natural to expect to find this bird breeding under similar conditions as its near congener, the Nashville Warbler, and while some of the scanty data suggested that it did so, certain statements were extant to the effect that the nests were to be found "in low bushes near the ground," doubtless the basis for such an assertion being one or two nests alleged to have been taken from small bushe at a height of three or four feet. The very few reliable records we have been able to find, coinciding largely with our own experience, suggest a doubt as to the correctness of identification of nests taken from such situations, and purporting to be those of the Tennessee Warbler.

This Warbler, because of its inconspicuous gray and olive green coloring, might easily escape observation, save for the singing of the males which perch high up in the large trees where they sing almost constantly. At the time of our visit to the breeding country, in the middle of June, nest building was completed and full sets of eggs had been laid. Altogether, ten nests were located, all built on the ground in substantially the same general sort of situation, and all but two were found by flushing the bird. The nest is built in the moss, usually in a wet place at the foot of a small bush, and in most cases in woods, somewhat back from the more open part of the clearings. A hollow is dug in the moss, usually beneath an overhanging bunch of grass. The nest is in nearly every case entirely concealed and it is impossible to see it from any view-point without displacing the overhanging grass. Consequently unless the bird is flushed it would be all but impossible to find it. The outer foundation of the nest is of dry grass, forming quite a substantial structure. Several nests had whisps of grass stems extend-

ing from the front rim, as noted in description of first nest below. It is lined, usually, with fine dry grass, to which in some instances the quill-like hairs of the porcupine, or white moose hairs, are added, and more rarely still, fine hair-like roots which were not identified. The females, so far as observed, do all the incubating and sit very closely,— so closely, in fact, that one was caught alive on the nest, where the exact situation had been previously marked. The nest is so carefully concealed that even when the bird is flushed it is sometimes very difficult to find it, so deeply is it buried in the moss.

This species seems to be somewhat gregarious. In 1914, in one small clearing, five males were heard singing at the same time. In 1915, in the same clearing, three males were heard singing at once, and two nests were found. In almost every clearing of suitable size at least two pairs of birds were found, the nests being sometimes located rather close together. The females, when once flushed off the nest, are very shy about returning while the observer is about, but one can easily tell whether a flushed female has a nest in the immediate neighborhood by the utterance of a sharp "chip," which is nervously given, the bird flitting constantly about from twig to twig, a habit which makes them difficult to collect in the heavy undergrowth.

On the second day of our sojourn, June 19, we visited one of the typical nesting places of this warbler, a boggy, cleared swale, with scattering, small second growth, and soon flushed a female from a nest containing six fresh, or practically fresh, eggs. This nest, typical of the majority of those found in both construction and situation, was placed in the side of a small tussock, bedded in moss and completely overhung by the dead grass of the previous year's growth. The nest was composed entirely of fine, nearly white, dead grass stems. From the front rim protruded outward and downward, a wisp of dead grass tips, lying over the lower grasses in the tussock, and shingled by the overhanging grass, establishing a continuity of the side of the tussock, thus cunningly adding to the perfect concealment. A tiny tree and one or two bush shoots grew from the tussock, close to the nest, and this feature was typical of the greater number of the nests found. Though larger, the nest was similar, both as to general appearance and situation,

to nests of the Nashville Warbler, found by Philipp and Wilcox the previous year, and to a nest of that species found by Bowdish in Ontario.

On June 20 another nest with six eggs was found, also situated in a moss bank, overhung with grass, in the edge of the woods and partially under the tips of a fallen dead branch. A nest with five fresh eggs, found on the same date, was snuggled down in the middle of a flat bed of moss, with little grass in the vicinity, and could be seen without the removal of any cover. This was the most striking departure from the type of nesting already described.

On June 22, a rainy day, the female was caught on the nest with six eggs, found June 20, by clapping a hat over the nest. On June 23 three nests were found, each containing five eggs, built in the typical situations before described. On June 24 another typically situated nest containing five eggs was found. Another was located on the same date which had been dragged from its original site, presumably by some mammal, bits of egg shell giving evidence of destruction of eggs. This was the most bulky and substantially built of all the nests found.

Another nest with five fresh eggs was found on June 26, and a nest in its original, typical situation, containing bits of egg shell, bespoke another tragedy. The last nest, found June 27, situated in the side of a grass tussock, in the edge of woods, just off a boggy clearing, contained *seven* eggs, in which incubation appeared to be half or more complete. These eggs had not hatched on July 1, the day before we left, and the last opportunity we had to examine the nest.

Four nests measured as follows, in inches:

1. Depth, outside, 2; inside, $1\frac{1}{2}$; diameter, outside, $3\frac{1}{2}$; inside, 2.
2. Depth, outside, $2\frac{1}{4}$; inside, $1\frac{1}{4}$; diameter, outside, 4; inside, $1\frac{1}{2}$.
3. Depth, outside, $3\frac{1}{4}$; inside, $1\frac{1}{8}$; diameter, outside, $3\frac{1}{2}$; inside, 2.
4. Depth, outside, 3; inside, $1\frac{1}{2}$; diameter, outside, 3; inside, $1\frac{1}{8}$.

None of these presented the "quite flat" appearance described by J. Parker Norris, Jr., in the nest taken by Allan Brooks in British Columbia. On the contrary, they were well cupped and, though far from bulky, were fairly substantially built.

The eggs vary from 5 to 7 in number, usually 5, and are dead white in ground color, well sprinkled with fine specks and small blotches of reddish brown, and less numerous and conspicuous lilac markings, more thickly about the large end, where, in perhaps a third of the specimens, they tend to form a wreath. Three sets measure as follows, in hundredths of an inch:

No. 1. .66 × .50; .62 × .47; .64 × .47; .62 × .47; .62 × .47; .62 × .47.

No. 2. .66 × .52; .65 × .51; .67 × .52; .64 × .51; .70 × .50.

No. 3. .64 × .49; .63 × .49; .65 × .47; .62 × .45; .63 × .47.

The males sing most persistently, and at all times of day, and as they sing from some perch, usually lofty, within a few rods of the nest, they give a good clue to its general location.

The song, though quite characteristic, is rather difficult to describe. In fact, the authors finding this beyond their powers, appealed to Mr. Louis Agassiz Fuertes, who kindly furnished the following notes:

"I would not recognize it among other 'Vermivoræ' by its 'chip,' but I usually spot its *song*, which to my ear is represented as 'Xee′, Xee′, Xee′ see′, see′, see′ see′-e-e-e-e-" or K'see′-K'see′, xee′, xee′, see′ see′ see′-e-e-e-e-.' It is done in a thin or wiry quality of tone, high, like a Nashville's, and is the only Warbler song I know that is a consistent accelerando from end to end, all on the same pitch. Though wiry, it is frequently quite loud, and may be heard for some distance. It may — and probably does — have more elaborated songs for the period of early summer, which I have never heard."

As a basis for estimating the frequency of song repetition, counts were kept on three singing birds for a period of five minutes each, with a result of 32, 36 and 22 songs, respectively, within the period. In one instance, a bird was observed to sing while on the wing, repeating the song twice in the course of a short flight.

In addition to the birds of the ten nests observed, at least a dozen males were heard singing in other localities within a radius of four or five miles. The Tennessee Warbler would appear to be one of the most numerous warblers of this part of New Brunswick, while the two nesting records of the Nashville Warbler in 1914 and one nest with four eggs, found on dry upland, June 29 of the

present year, would, according to our experience, seem little more than casual.

The stomachs of four birds taken were preserved and sent to Mr. H. W. Henshaw, Chief of the Biological Survey, United States Department of Agriculture, who kindly furnished the following copies of analyses of contents:

No. 1, male, June 21, contents; eight small caterpillars (as in No. 3), 35%; Dipterous fragments, 23%; a small spider, 2%; scale-like fragments (perhaps of some catkin), 40%.

No. 2, female, June 22; empty.

No. 3, female, June 23, contents: a camponotid ant, 16%; at least 78 small caterpillars (Tortricidæ), 75%; a snail (Vitrea hammoides) 4%; unidentified vegetable fragments, 5%.

No. 4, male, June 28, contents: 3 Lampyrids near Podabrus, 8%; a small Coleopterous (?) larva, 3%; about 15 small caterpillars (as in No. 3), 25%; a Neuropterous insect (apparently a caddis fly), 50%; 2 small spiders, 14%; trace of unidentified vegetable matter.

In connection with the subject of food, a note published in the 'Bulletin of the Nuttall Ornithological Club,' Vol. V, 1880, page 48, by J. A. Allen, cites destruction of grapes by these birds in Kansas in September of the previous year, the birds puncturing the skin and eating the pulp or succulent parts.

On the other hand, W. F. McAtee, describing his experience with injury to grapes by these birds, in 'The Auk,' Vol. XXI, 1904, page 489, found that while puncturing many grapes, the Warblers did not eat the pulp, but seemed to quench their thirst with the juice. Examination of stomach contents showed insects of species most injurious to grapevines, and as the Warblers are present in the grape growing areas as transients only, it is argued that such harm as is wrought by the grape puncturing habit is probably far more than offset by the insects eaten. The suggestion is also made that by supplying abundance of water, the injurious habit might be eliminated.

Little information seems available as to the migration of the Tennessee Warbler in New Brunswick. The Biological Survey has but two records of arrival, both for Petit Codiac, by John Brittain; May 19, 1886, and May 26, 1888.

In conclusion, it may be of interest to cite the more pertinent

published data respecting the breeding of the Tennessee Warbler, which we have been able to locate.

In 'The Warblers of North America,' Chapman cites C. J. Maynard 'Birds of Coos Co., N. H. and Oxford Co., Me.,' (Proceedings Boston Society Natural History, 1871, page 7) who "found it to be very common in wooded localities about Umbagog." The citation does not state that nests were found and we have not been able to consult the source cited.

H. D. Minot, 'Land and Game Birds of New England,' 1876, states that "the nest and eggs are essentially like those of the Nashville Warbler, though the eggs vary and exhibit certain peculiar forms, and though the nest is 'often placed in the woods.'"

In the 'Bulletin of the Nuttall Ornithological Club,' Vol. VI, 1881, page 7, C. Hart Merriam, in 'Birds of the Adirondac Region,' states of the Tennessee Warbler: "Breeds. Not rare in suitable localities. Generally prefers hard-wood areas." In a list of the birds of Point De Monts, Quebec, the same author in the same publication, Vol. VII, 1882, page 234, says: "A tolerably common summer resident."

J. H. Langille, 'Our Birds in Their Haunts,' 1884, says "It breeds far to the north, its nest having been found in Michipicoton, on Lake Superior."

Ernest Thompson Seton, 'The Birds of Western Manitoba,' (Auk, Vol. III, 1886, pages 325-326) gives the Tennessee Warbler as a "Rare summer resident."

Walter Faxon found a singing male in Berkshire Co., Mass., July 15, 1888; (Auk, Vol. VI, 1889, page 102). He quotes William Brewster as always having found it in conifer regions and C. H. Merriam and J. A. Allen as having found it frequenting hard wood.

John Brittain and Philip Cox, Jr., in notes on summer birds of the Restigouche Valley, New Brunswick (Auk, Vol. VI, 1889, page 118) give the Tennessee Warbler as "Very rare."

In 'Bulletin No. 18, United States Department of Agriculture — Bureau of Biological Survey,' Wells W. Cooke records two sets of eggs taken by one of the parties of the Biological Survey in the summer of 1901 at Fort Smith, Mackenzie. "These eggs are among the first absolutely authentic specimens known to science." This note however gives no description of the nesting habits.

J. Parker Norris, Jr., describes (Auk, Vol. XIX, 1902, page 88) a nest and four eggs in his collection, taken by Allan Brooks at Cariboo, British Columbia, June 15, 1901. On the same date Brooks found another nest with newly hatched young and several more nests with young the following week. From this it would appear that the breeding season there was a week or two earlier than we found it in New Brunswick. We infer from Brooks' data that he found the birds nesting on dry ground, but otherwise the situation of the nests, arched over by dry grass, seems to have been the same as in the case of the New Brunswick nests. Norris' description of these eggs agrees largely with those we observed, but his nest differs both as to the flat appearance previously mentioned and in having a greater variety of material, leaves not occurring in the nests we found, while moss was seldom used by the New Brunswick birds. A photograph of the nest in the Norris collection appears in 'The Oölogist,' (Vol. XXII, 1905, page 134).

Macoun's Catalogue of Canadian Birds, as to breeding, only quotes the description of the Norris nest, above mentioned, and an alleged nest reported by W. Raine as having been taken near Edmonton, Alberta, in 1899, situated two feet up in a willow bush. O. W. Knight in his 'Birds of Maine' reports a nest found by C. D. Farrer, near South Lewiston, Maine, June 4, 1895, containing five eggs, advanced in incubation, and other nests with young, found near Bangor, Maine.

The August, 1915, issue of 'The Oölogist' reports a nest and four eggs in the collection of Gerard Alan Abbott, taken by E. Arnold, at Gaff Topsail, Newfoundland, June 25, 1913.

THE COURTSHIP OF THE MERGANSER, MALLARD, BLACK DUCK, BALDPATE, WOOD DUCK AND BUFFLEHEAD.[1]

BY CHARLES W. TOWNSEND, M. D.

THE following studies have all been made within the limits of large cities, where the birds, protected from gunners, act without fear and show, sometimes at close range, their natural characteristics. The Baldpate has been studied at Jamaica and Leverett Ponds, the Merganser, Mallard and Black Duck at these ponds and in the Fens and Back-Bay Basin — all in the Boston Park System — in the reservoir at Chestnut Hill and at Fresh Pond in Cambridge. All of these bodies of water are within four miles of the Boston State House, and, as I frequently pass near them, I have made a practice for several years of stopping whenever possible and watching the ducks through strong binoculars. The Bufflehead has been studied chiefly at Squantum and at Lynn Beach, while the Wood Duck has been watched at still closer range in the Boston Zoölogical Park. All my notes, which were made on the spot and extend over several years, are drawn upon so as to give as complete a picture as possible for each bird. This seems worth while as so little has been published on the courtship of North American ducks. The reader is referred to previous papers on the courtship of the Golden-eye and Eider [2] and of the Red-breasted Merganser.[3]

The occupations of wintering ducks may be roughly divided into three parts. Most of their time is spent in procuring food either by diving or dipping; another part is devoted to preening their feathers and to sleeping either on the water or on the shore or ice; the rest is devoted to courtship. Courtship is commonly to be seen in the autumn months, less frequently in December and January, but it occupies more and more time and increases in ardency during February, March and April, before the departure of the

[1] Read before the Nuttall Ornithological Club, April 26, 1915.
[2] Auk, XXVII, 1910, p. 177.
[3] Auk, XXVIII, 1911, p. 341.

birds for the breeding grounds. A group of birds are apt to be all doing the same thing at the same time. For example, courting may be going on actively, when suddenly the flock takes to diving or dipping. Again the birds may become indolent, and doze and preen themselves, so that one may often be disappointed on visiting a pond to find the ducks all feeding or dozing and not courting. If one's time is limited, he may often draw a blank.

If, in a group of ducks the drakes are seen to be restlessly swimming back and forth or weaving their way in and out through the crowd as if they were at an afternoon tea, the case looks promising. This afternoon-tea-effect is very characteristic of courtship among water birds in general, and one can often tell at a glance whether courtship is in progress or not. The most favorable opportunity for observation is afforded when the ducks are crowded into a small area of open water near the shore by the freezing over of the larger part of the pond.

There is a great variety in the methods of courtship of ducks from the very spectacular performance,— the song and dance — of the Whistler to the simpler movements of the Mallard, but one can trace in most of them a general family resemblance. All are interesting as primitive forms of dancing, an art which has undergone wonderful developments in the human species, but undoubtedly owes its origin to courtship impulses. It is to be noted that, even among mankind, the dance may not be with the feet alone, but may include movements of the body, neck, head, arms and hands. Indeed certain human dances in Java and some of the Oceanic islands are limited to one or more of these last named movements without any leg action.

The courtship of the Merganser or Goosander (*Mergus americanus*), is fairly spectacular and differs widely from that of its red-breasted cousin, *M. serrator*. The only description I can find of it is one by Mr. William Brewster [1] who states that he saw the performance on March 16, 1909, at Fresh Pond, Cambridge. This and the brief description given by Mr. J. G. Millais [2] of the Courtship of the European Merganser (*Mergus merganser*),— a

[1] Bird Lore, XIII, 1911, p. 125–127.
[2] British Diving Ducks, 1913, vol. 2, p. 94.

bird which is regarded by many authors as identical with *M. americanus* — correspond very closely to my own observations which now follow:

A group of five or six male Mergansers may be seen swimming energetically back and forth by three or four passive females. Sometimes the drakes swim in a compact mass or in a file for six or seven yards or even farther, and then each turns abruptly and swims back. Again they swim in and out among each other, and every now and then one with swelling breast and slightly raised wings spurts ahead at great speed by himself or in the pursuit of a rival. The birds suggest swift motor boats by the waves which curl up on either side, and by the rapidity with which they turn and swash around. Again they suggest polo-ponies, as one in rapid course pushes sidewise against a rival, in order to keep him away from the object of the quest. They frequently strike at each other with their bills, and I have seen two splendid drakes rise up in the water breast to breast, and, amid a great splashing, during which it was impossible to see details, fight like game-cocks. The pursuit is varied by sudden, momentary dives and much splashing of water.

The smooth iridescent green heads, the brilliant carmine bills tipped with black nails, the snowy white of flanks and wing patches and the red feet, which flash out in the dive, make a wonderful color effect, contrasting well with the dark water and white ice. The smaller females with their shaggy brown heads, their neat white throat-bibs, their quaker blue-gray backs and modest wing patches, which are generally hidden, are fitting foils to their mates. I have reserved for the last the mention of the delicate salmon yellow tint of the lower breast and the belly of the male, a coloration of which he is deservedly proud, for, during courtship, he frequently raises himself up almost on to his tail with or without a flapping of the wings and reveals this color, in the same way that the Eider displays his jet black shield. Most of the time he keeps his tail cocked up and spread, so that it shows from behind a white centre and blue border. Every now and then he points his head and closed bill up at an angle of forty-five degrees or to the zenith. Again he bows or bobs his head nervously and often at the same time tilts up the front of his breast from which flashes out the salmon

tint. From time to time he emits a quickly repeated purring note, *dorr – dorr* or *krr – krr.*

The most surprising part of the performance is the spurt of water fully three or four feet long which every now and then is sent backwards into the air by the powerful kick of the drake's foot. It is similar to the performance of the Whistler but much greater, and while the foot of the Whistler is easily seen and is plainly a part of the display, it is difficult to see the red foot of the Merganser in the rush of water, although it is evident doubtless, to the females. The display of the brilliantly colored foot in both species is probably the primary sexual display, and the splash, at first incidental and secondary, has now become of primary importance.

During all this time the female swims about unconcernedly, merely keeping out of the way of the ardent and belligerent males, although she sometimes joins in the dance and bobs in a mild way. At last she succumbs to the captivating display and submerges herself so that only a small part of her body with a bit of the crest appear above the water, and she swims slowly beside or after her mate, sometimes even touching him with her bill. Later she remains motionless, flattens herself still more, the crest disappears and she sinks so that only a line like that made by a board floating on the water is seen. One would never imagine it to be a live duck. The drake slowly swims around her several times, twitches his head and neck, picks at the water, at his own feathers and at her before he mounts and completely submerges her, holding tightly with his bill to her neck meanwhile. Then she bathes herself, washes the water vigorously through her feathers and flaps her wings; the drake stretches himself and flaps his wings likewise. From the beginning of submergence by the female the process is the same in all the duck family that I have observed.

The Mallard (*Anas platyrhynchos*) is a common duck in Jamaica and Leverett Ponds, in the Fens and in the Back Bay Basin. Most of these birds have been introduced by the Park Department and semi-domesticated, and some are housed in winter, but there are always a considerable number that fly freely and spend the winter in the few open places at the entrance of springs and water courses that are to be found at that season. They are practically wild birds, and it is possible and probable that some are really wild.

Many of them have more or less blood of the Black Duck, but my courtship description applies to what appeared to be full blooded Mallards.

When the Mallard drake courts, he swims restlessly about following or sidling up to a duck. She may lead him quite a chase before she vouchsafes to acknowledge his presence, although he is continually bowing to her, bobbing his head up and down in nervous jerks so that the yellow bill dips into the water for a quarter of its length and comes up dripping. He also rears himself up in the water and from time to time displays his breast. She occasionally turns her head to one side and carelessly dabbles her bill in the water, but sooner or later, if all goes well, she begins to bow also, less vigorously at first — not touching the water at all — and to the empty space in front of her. Suddenly she turns and the pair bow to each other in the same energetic nervous jerks, and, unless a rival appears to spoil the situation, the drake has won his suit. A somewhat similar description of the courtship is given by J. G. Millais,[1] but none as far as I know has been given by American writers.

The most numerous duck in the fresh waters in and about Boston is the Black Duck and both *Anas rubripes rubripes* and *Anas rubripes tristis* are well represented throughout the winter and spring. A group of fifteen or twenty may be seen solemnly feeding by dipping, with their tails pointing zenithward, when they begin to swim about nervously, weaving their ways in and out among their fellows. Now one swims rapidly with head low and darts at another that, in order to avoid him, dives just below the surface with a great splashing with his wings. Soon nearly the whole group are chasing each other and diving awkwardly. Every now and then the short quack of the drake is heard, sometimes the loud croak of the duck. Now a drake flys for fifteen or twenty feet over the water with drooping body and legs and plumps down by a duck with a splash and an impetus that carries him three or four feet further. This is repeated again and again by the drakes and is a conspicuous part of the courtship. At times they bob the head in a manner exactly similar to that already described in the case of the

[1] The Natural History of the British Surface-feeding Ducks, 1902, p. 6.

Mallard. The bobbing does not continue so long, for the short flights seem to play a more essential and important part in the courtship of the Black Duck. It is possible that the white lower surface of the wings revealed in these short flights may have an entrancing effect on the females. The under surface of the wings of Pigeons who indulge in the same tactics on land are also white. It is a common courtship action however, even with birds whose under wing surface is not conspicuous and, it seems to me, these flights are very different from the pursuit in the air of the female by one or more males. The short flights are courtship displays for the purpose of attracting the female and of leading to a choice. The pursuit flights are different and are not in the nature of display; it is possible indeed that the choice has already been made. Such flights take place both in the case of the Black Duck and of the Mallard and probably of other species.

A striking instance of pursuit flight in the Black Duck observed in Southern Labrador in 1909, I have described as follows:[1]

"At Esquimeaux Point on June 2, as I was standing on the rocks on the shore, I was startled by the loud quack or croak characteristic of the female black duck, and looking up I saw two large black ducks, evidently males, in close pursuit of a smaller female. They doubled and twisted in a manner wonderful to see, as the duck appeared to be straining every nerve to elude the drakes. At last one of the drakes gave up the pursuit and disappeared over the low forest, whereupon the other drake and the duck sailed away together, as if it had all been arranged beforehand, straight to a secluded pool out of sight behind the rocks."

Mr. Bent has seen similar flights in the Mallard in Manitoba and thus describes it:[2] "I have seen as many as three males in ardent pursuit of one female, flying about high in the air, circling over the marshes in rapid flight and quacking loudly; finally the duck flies up to the drake of her choice, touches him with her bill and the two fly off together, leaving the unlucky suitors to seek other mates."

I have found no previous mention of the courtship of the Black

[1] "A Labrador Spring," 1910, p. 95.
[2] MS.

Duck except one by Mr. Edmund J. Sawyer [1] who describes the actions of two Black Ducks that flew repeatedly two or three rods back and forth in a small pool, alighting each time with splashings of the water while other ducks swam about unconcernedly. An interesting sketch of this courtship flight illustrates the article.

The Baldpate (*Mareca americana*) is a charming little duck with his pale blue bill, snowy white pate, and vinous breast. He is an arrant thief, however, and much prefers to rob his diving neighbors, particularly the Coot and Lesser Scaup, of their provender brought from the bottom by honest labor, than to search the shallower waters by his own limited method of dipping. The robbery is bold and open, and apparently awakens no resentment. In his courting he continually emits gentle but eager whistling notes, and with neck extended and head low, bill wide open and wings elevated behind so that the tips are pointed up at an angle of forty-five degrees, he swims rapidly over the water behind or beside the duck. Occasionally he pecks playfully at the side of her head, and now and then in his excitement jumps clear of the water and flies for two or three yards.

I have found no previous account of the courtship of this species. Millais' description of the courtship of the European Wigeon (*Mareca penelope*) shows a striking similarity, the only difference being in the character of the note emitted. Millais [2] says that as the female swims away, the drakes "follow in a close phalanx, every male raising his crest, stretching out his neck close over the water and erecting the beautiful long feathers of the scapulars to show them off. He also depresses the shoulder joint downwards, so as to elevate the primaries in the air. All the time the amorous males keep up a perfect babble of loud Whee — ous, and they are by far the noisiest of ducks in their courtship."

The courtship of the Wood Duck (*Aix sponsa*) is a pretty sight. The gorgeously colored drake swims close to his modest little wife who is dressed in quaker gray and wears large white spectacles. If she swims too fast for him he is apt to touch her head with his bill, and when she stops he jerks his head up and down in an

[1] Bird Lore, XI, 1909, p. 195.
[2] British Surface-feeding Ducks, p. 45.

abbreviated bow. At the same time he whistles in a low sweet way as if he were drawing in rather than blowing out his breath. The feathers of his crest and head are at the same time erected.

The only description heretofore given of this courtship that I can find, with the exception of a partial one by Hatch,[1] is the following from Audubon:[2] "Observe that fine drake. How gracefully he raises his head and curves his neck. As he bows before the object of his love, he raises for a moment his silken crest. His throat is swelled and from it there issues a guttural sound, which to his beloved is as sweet as the song of the Wood Thrush to its gentle mate. The female as if not unwilling to manifest the desire to please which she really feels, swims close by his side, now and then caresses him by touching his feathers with her bill, and shows displeasure towards any other of her sex that may come near. Soon the happy pair separate from the rest, repeat every now and then their caresses, and at length having sealed the conjugal compact, fly off to the woods to search for a large Woodpecker's hole."

The Bufflehead (*Charitonetta albeola*) in nuptial plumage is a handsome sight and well deserves his name for his head is as large in proportion to his body as is the Buffalo's, for *buffle-head* means, I suppose, *buffalo-head*. The white triangle behind the eyes contrasts strikingly with the glossy greenish-black forehead, and the white of the flanks rolls up over the white of the wings. The female is much more modestly dressed and only a small white patch adorns her smaller head.

As far as I know the courtship of this species has never been described. Millais[3] says "From what I could gather from naturalists in British Columbia the Courtship is very like, if not exactly similar to that of the Golden-eye, but no one seems to have observed it at close range." As will be seen my own observations do not bear this out.

A group of thirty-five or forty of these birds with sexes about equally divided may have been actively feeding, swimming together in a compact flock all pointing the same way. They dive within a few seconds of each other and stay under water 14 to 20

[1] P. L. Hatch, "Notes on the Birds of Minnesota," 1892, p. 54.
[2] Birds of America, 1842, VI, p. 275.
[3] British Diving Ducks, Vol. I, p. 109.

seconds and repeat the diving at frequent intervals.[1] Suddenly a male swims vigorously at another with flapping wings, making the water boil, and soon each male is ardently courting. He spreads and cocks his tail, puffs out the feathers of his head and cheeks, extends his bill straight out in front close to the water and every now and then throws it back with a bob in a sort of reversed bow. All the time he swims rapidly, and, whereas in feeding the group were all swimming the same way in an orderly manner, the drakes are now nervously swimming back and forth and in and out through the crowd. Every now and then there is a commotion in the water as one or more drakes dive with a splashing of water only to come up again in pursuit or retreat. As the excitement grows a drake flaps his wings frequently and then jumps from the water and flies low with outstretched neck towards a duck who has listlessly strayed from the group. He alights beside her precipitately, sliding along on his tail, his breast and head elevated to their utmost extent and held erect. He bobs nervously. And so it goes.

RHYTHMICAL SINGING OF VEERIES.

BY HENRY OLDYS.

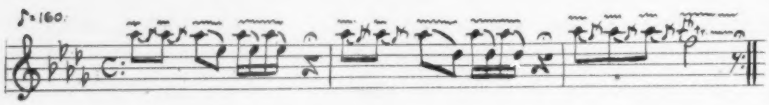
IN a recent article in 'The Independent' I made the following statement:

"Thrush songs are especially worthy of careful investigation, because of their advanced character. Those of superior Olive-backed, Hermit, and Wood Thrushes, disclose a rhythmical arrangement very satisfying to the human ear; and from incomplete study of the singing of the Veery, I am inclined to believe that the oboe phrases of this member of the thrush family will, in some instances, be found, on close attention, to show a similar arrangement."

Since this article was published (20th July, 1914) I have been so

[1] A series of four dives timed with a stop watch in the Back Bay Basin averaged 18 seconds, varying between 14 and 20 seconds. At Lynn Beach of four dives three were 17 seconds, one, 15 seconds, in duration.

fortunate as to have noted several verifications of this prediction, the first as recently as May 19, 1915. I was at Rhinebeck, N. Y., at the charming home of Mr. Maunsell S. Crosby, an enthusiastic student of bird life. In the late afternoon, as we were standing beside a large pond (or small lake) on his place, our attention was attracted by the singing of a Veery. Other Veery songs had greeted our ears, but this one particularly excited our interest because of its containing a short phrase with a closing trill. We had listened but a moment or two when it became evident that this shorter phrase occurred with regular frequency, following two other phrases, which differed from each other slightly and had each its fixed place in the song.

On our making this discovery I directed my efforts toward obtaining an exact record of the song. It is extremely difficult to record all the minor notes of a Veery or a Hermit Thrush, and the record I secured is not perfect in this respect. It shows, however, the principal notes — those that give the song its character — and is sufficiently correct to represent the phrases substantially as they were sung. The following is the record I made:

All the notes were given with the Veery 'burr,' which I have indicated by the wavy lines above them. While I listened the song was repeated fifteen or twenty times and, so far as I observed, without variation.

The proximity of the dinner hour compelled a suspension of my study of the song sooner than I should have wished; but I contented myself with the hope that I might have an opportunity to resume the study on the following morning before breakfast. In this I was disappointed, for although Mr. Crosby and I were on the scene very early the next morning, the bird remained absolutely silent during our entire stay in the vicinity. Perhaps it had passed on to the north.

No further opportunity presented itself for investigation of Veery music until a lecturing trip for the University of Minnesota

brought me to Taylor's Falls, Minn., on June 9. At this attractive spot beside the Dalles of the St. Croix I was so fortunate as to make several interesting ornithological notes, including the record of two rhythmical Veery songs. The first bird was singing in regular order three phrases, each with different closing notes, like those of the Rhinebeck Veery, and also with an additional opening note in the third phrase, as in the case of the Rhinebeck bird. To show the rhythm alone these phrases may be freely syllabled thus:

Wee-te-a-wee, te-a-wee, te-a-wee:
Wee-te-a-wee, te-a-wee, te-a-wee:
Wee-te-te-a-wee, te-a-wee, te-a-wee.

I did not take the notes, chiefly because of the presence in the vicinity of a voluble Rose-breasted Grosbeak, an energetic brass band with a particularly enthusiastic bass drummer, and a merry-go-round with the usual depressing music, traction-engine whistle, and other noise producers.

The second bird was uttering a song of *four* phrases, in which the first and third phrases were identical and ended with A flat; the second phrase was similar to these, but closed with G flat (both of these closing notes being long); and the fourth phrase was noticeably shorter than any of the others and was finished with an indeterminate broken chord.

The following day I was at Moose Lake, Minn., a point about forty miles south of Duluth. Veeries were plentiful and were singing freely. Every song I listened to critically consisted of three different phrases, repeated always in the same order. Another point of resemblance to the Rhinebeck song was that the first part of each phrase consisted of two higher notes and the second of a broken chord on a lower pitch repeated without further change of pitch. In the notations of Veeries' songs made by other musicians the closing notes have sometimes been represented as chords; but I believe that what these listeners heard were not actual chords, but broken chords, the separate notes of which were uttered so rapidly as to cause them to seem to blend in complete harmony.

The Veery's singing offers a very difficult study to the recorder of bird music; but because of its very difficulty it is especially tempting to an enthusiastic and conscientious explorer of this

neglected field of natural history. Because of its difficulty, also, it should be undertaken only by trained musicians. For while much excellent work in describing and differentiating bird songs has been done by naturalists who lack musical training, yet the final word as regards birds' notes must be spoken by the musician, whose education fits him to observe important features that are quite certain to escape the attention of one whose musical ear has never been cultivated. In lectures and writings I have persistently endeavored to arouse the interest of musicians in this fascinating and important phase of ornithological research; and while my efforts have met with some success, yet there is pressing demand for many, many more properly equipped students.

Let me take this opportunity to say a few words about the noting of bird songs. Adequate appreciation is not given by either naturalists or musicians to the fact that a number of problems, not inferior in importance to any to which ornithologists are devoting their energies, require for their solution careful and exhaustive study of the utterances of birds by competent musicians. The question of the extent of the part played by inheritance in specific songs is on a par with similar questions relating to migration, nest-building, feeding, and other activities of birds. The matter of the growth of vocal ability in young birds (which has scarcely been touched) and that of seasonal activity in singing are fully as important as the allied questions of plumage growth and seasonal moult — in each case development follows normally definite lines dependent on the previous evolutionary history of the species. And such problems as the reason for song, the origin of song, the reason for governance of bird music by laws of rhythmical sequence, similar to — often identical with — laws that govern human music, open up broad fields of research which in interest and value stand unrivaled; for they inseparably connect themselves with one of the greatest, most interesting, and least understood problems of psychology — the origin and development of æsthetic taste in man.

The young student of bird songs need not be discouraged if he finds his records out of accord with those of other observers; nor should he sweepingly condemn the work of others because of such discrepancy. Because of the great individual diversity of bird

songs; the impossibility in the case of some songs, of making more than merely suggestive records (though such suggestive records have a value, often important); and the extreme difficulty, in certain other instances, of securing a perfect record, legitimate differences of interpretation will arise in this branch of ornithology, as in all other branches. Such discrepancies will gradually disappear as knowledge progresses.

But all such points, be it understood, can best be discussed by musical scientists, rather than non-musical scientists, whose lack of musical information often leads them to offer frivolous and absurd objections. (One such criticism in the case of a published record of a Bewick's wren song showed ignorance of the fundamental fact that the key of a song merely indicates its pitch, and was based on the ludicrous notion that it would be more difficult for a bird to sing in six flats than in one!)

The study of thrush music is of especial value, owing to its advanced character in comparison with most bird music; and it is my earnest hope that musicians living within the breeding ranges of different members of the thrush family throughout the world may become interested in making permanent records of noteworthy songs, and thus preserve them to science.

TWO PROBLEMS IN THE MIGRATION OF WATER FOWL.

BY JOHN C. PHILLIPS.

I. DO AMERICAN DUCKS REACH THE MARSHALL ISLANDS?

I HAVE recently run across an ornithological item of great interest, which as far as I know has not been brought to the attention of American ornithologists. This concerns the capture of three species of American ducks in the Marshall Isles, northeast of New Guinea. These islands lie on the parallel of 10° N. latitude and are over 2200 miles southwest of the Hawaiian Islands and obviously far off the known course of any American migrants.

In 1899, Reichenow, the well-known German ornithologist, reported (Ornith. Monatsb., p. 41) that Herr Brandeis, Imperial Governor of the Marshalls, had written of a remarkable flight of birds. "Each year at the end of October, coming from the north, enormous wedge-shaped flocks of wild ducks come in continuous flight over Atoll Bikar, Uterick, Ailuk, Jemo, Likieb and Wotje. These flocks cover the sky for three or four days. Tired birds from these flights settle down on the islands and after they have recuperated, set out in small flocks in a *southerly direction* [italics mine] following the main flock. In May similar flocks appear again, flying north, which on this occasion take their way over Atoll Ailinglablab, and from there between Kwadjelin and Likieb and over Gasparico. The planter de Brum is going to obtain some specimens."

In the same Journal for 1901, p. 17, Herr Reichenow records the receipt of Marshall Island duck skins sent by Herr Dr. Bartels from Jaluit to the Zoölogical Museum at Berlin. The species were *Anas carolinensis*, *A. acuta americana* and *Nyroca valisneria*.

Reichenow adds that he thinks these ducks must come from Alaska, perhaps the valley of the Lower Yukon, and from there they may take their course along the Alaskan Peninsula to the Aleutian Islands and go south over the ocean. He asks where these ducks can winter, and adds that a further flight would take

them to the New Hebrides and New Zealand. Notwithstanding this, no such birds have ever been taken either there or in Australia, New Guinea or the Polynesia Isles. He thinks there must be some large shallow, quiet tracts in the Polynesian Ocean where sea-weed collects. Possibly they might find a feeding ground among the small coral islands between the Solomons and Australia.

The above facts excite no end of speculation but in view of the meagre data at hand and the extraordinary character of the information we must wait for further reports.

From the north Pacific coast to the Marshalls is roughly 5000 miles, a distance which is far greater than any trans-ocean flight yet known. Obviously until we know the predominating species among this body of ducks, it is almost impossible to guess at its origin. The farthest Pacific point which our migrants reach is the Hawaiian group. Here the Pintail and Shoveller are the only common ducks, and these are by no means in really large numbers, while the Baldpate, Mallard, Green-winged Teal, Buffle-head are extremely rare migrants (Henshaw, 1902). The Red-breasted Merganser is perhaps not quite so rare.

From this it does not seem likely that the mysterious Marshall Isle flight ever strikes the Hawaiian group.

As to the breeding ground of the three species mentioned by Reichenow we can at least say that it must be American, but the occurrence of the Canvas-back suggests a mid-continental origin, that is, provided the Canvas-back occurs in large numbers. This duck is so sparsely distributed on the north Pacific coast, and is so infrequent a breeder in Alaska that the Yukon Valley could hardly supply a great body of migrants.

Mr. Henshaw (Auk, 1900, p. 245) tells us of the 2000 mile flight of certain migrants from the Aleutians to the Hawaiian group, but remarkable as is this fact, it would be entirely eclipsed by the appearance of American birds 2000 miles further from our continent.

Mr. Bent (Smith. Mic. Collec., Vol. 56, No. 32) believes that the European Teal probably breeds on the whole Aleutian chain of islands, and that the American Green-winged Teal is confined to the mainland of Alaska. This makes the appearance of *N. carolinensis* in the Pacific still more mystifying.

The question of the winter distribution of these ducks is scarcely

worth guessing at until further data are available. It is not possible that they can ever reach the coast of Australia, as the avifauna there is so well known that even as stragglers they could not escape detection. The coast of New Guinea is also fairly well known, but the Solomon Islands are as yet only imperfectly explored, though American ducks along the coasts ought certainly to have been reported.

A brief investigation makes me very skeptical of the presence of an oceanic feeding place. There is no large windless area in the Polynesian Sea, at least not during the winter months, and it is almost beyond belief that Teal, or Canvas-backs either, could lead a really oceanic life for any length of time. Moreover, the ocean south of the Marshalls is very deep, and the borders of the coralline atolls offer a very unattractive vegetable supply. The surface flora of these seas is not rich, and there is no indication of a sargasso sea.

II. Behavior and Makeup of the Migrating Flocks of Canada Geese.

In 'The Auk' for July, 1910, I called attention to a peculiar action of migrating Canada Geese, long familiar to those who have shot geese over live decoys. At that time I saw nothing significant in this behavior, but, looking at it in a different way, it seems at least worth recording again.

The facts referred to are the following. Canada geese (*Branta canadensis*) migrate in large and small flocks, and they are decoyed down to some of the Massachusetts ponds which happen to be situated on favorite flight lines, by the use of an elaborate system of live and wooden decoys. Many of the wild geese would not alight in the ponds at all, were it not for the irresistible attraction of the decoys. The nature of geese is, of course, exceedingly wild. They usually alight well out in the pond, and, after a varying period, swim towards the decoy geese on the shore. At such a time the slightest disturbance will alarm them. A distant boat, a gun shot, a person walking along the shore, or a noise from the shooting stand will result either in their taking to wing and continuing their flight, or in keeping them in the middle of the pond, suspicious of the surroundings.

Now if a successful shot is finally made into such a flock, and perhaps one half or three fourths of their number have been killed, the remainder, after a few turns in the air, or a short flight of five or ten minutes, will almost always return to the pond, where, if not actually disturbed, they will remain from several hours to a day or so. Sometimes they will decoy a second time.

Now the method employed in capturing such "left over" geese is to put out a boat, which manœuvre is seldom objected to, and to scull directly down upon them. A close shot is often obtained from the boat and an approach of from sixty to seventy-five yards is almost always possible. If disturbed, such geese nearly always come back to another part of the pond, when the same process is repeated, only the birds get a little wilder each time, as a rule. The more successful the first shot from the stand and the less geese there are "left over," the better is the chance of obtaining a close shot from a boat.

Now this curious "stupidity" is manifested by the same geese, which, in an organized migrating flock only a few minutes before, would have left the pond at the slightest indication of danger. Some mutual interrelation has become disorganized, and that this has been caused by something more than fright alone would seem probable, because on the winter feeding grounds geese do not show any such "stupidity," but simply depart post-haste after some or many of their numbers have fallen. Also in a Massachusetts decoy pond, if, through some error, a poor shot or total miss is made, the frightened flock simply holds on its way South, and is not seen again. Of course the presence of the live decoys has something to do with the puzzled behavior of the geese, but will it explain their disregard of an approaching boat.

It is to be remarked that the geese referred to are birds in full migration and thus under the impelling force of a peculiar "instinct."

That geese migrate in families and that autumn flocks at least are composed of parents and their young has always been inferred. This theory is strengthened by the actual count of large numbers of flocks of geese on the autumn migration in Massachusetts made by myself at Wenham and Oldham Ponds. When plotted out in a frequency curve, we get a marked rise in the curve running

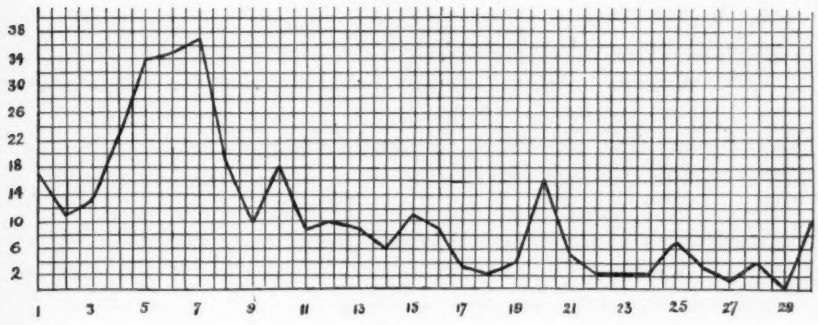
up from a flock of two to a flock of five, the apex being at the number seven. Then the curve falls to a right hand base at the number nine. Above this number there are small rises in the curve at various points, notably ten, fifteen and twenty, which may have some significance, but as we go up into the larger flocks, the numbers (number of flocks counted) are smaller, and the counts themselves perhaps not so accurate. The "small flock" frequency curve (flocks of one to fifteen in number) is composed of counts of 262 different flocks. It gives us the usual size as six or seven birds, the next commonest number being five. The scarcity of flocks of eight and nine is remarkable. Only ten flocks of nine each were observed, while there were thirty-seven flocks of seven each and thirty-five flocks of six each. The actual average size of a flock of autumn migrants in Massachusetts is not considered here. It is much larger, nearer thirty-five, because very large flocks of 100 to 300 are not rare. These large flocks need not concern us.

It is of interest to note that the small flocks, when they are captured entire, show from inspection of various external age characters — size, roughness of soles of feet, development of wing spurs, etc.— a pair of old birds and several young, two to five, or even six. It is especially easy to pick out the young birds from the old in early October flights, because the young have had less time to develop, but it is not always possible to do this with certainty. We are speaking, of course, of the fall migration only. Whether these facts, special behavior and individual make-up of the "small flock," hold for the vernal migration is unknown to me, and it would be harder to ascertain.

I give below a curve of frequency for flocks of geese of from one to thirty in number. The peaks of the curve at ten, fifteen and twenty may mean combinations of two, three, or four families: but as noted above the observations are hardly numerous enough for the larger flocks. The striking fact is the very sharp rise of the curve to six and seven. The frequency of ones and twos and even threes and fours is much too high, because I have had to include in the curve a number of geese undoubtedly left over from shot-up flocks. In the natural state of affairs there would probably be very few flocks below the number four. Flocks of eight are perhaps mostly one large family, while flocks of nine are composed of small families.

I plotted two separate curves in this way from observations made both at Wenham, Mass., and at Pembroke, Mass., and both curves were exactly alike, showing the same rises and falls which this combined curve shows, so that I feel sure that we are dealing with something significant.

It is hardly necessary to state that the apex of this curve, at six and seven, represents the average size of a family of Canada



Geese as demonstrated by wild nests and captive pairs, so that our flock counts are exactly what we would expect from single families.

In conclusion I may say that (I) The peculiar behavior of migrating geese when shot into over live decoys is not explainable on the basis of fright alone, but suggests the temporary breaking of a special form of interdependence, resulting in a curious lack of alertness in the individuals left behind. Is this due to parents seeking young, or to young with parental guidance removed, or to both causes. (II) Geese migrate in family parties and groups of families. The usual size of a family is six or seven, often it is five, and occasionally eight.

A STUDY OF THE SEASONAL DECLINE OF BIRD SONG.

BY HENRY J. FRY.

THIS study of the decline of bird song was made at the 1914 Summer School of the Biological Laboratories at Cold Spring Harbor, Long Island, while taking the course offered there in ornithology. Observations were begun July 1, and the last were made August 10, hence the period studied comprises forty-one days.

All work on the problem was confined to a limited area, not more than three quarters of a mile square, centering about the end of Cold Spring Harbor, which is an inlet from Long Island Sound. The region contains an unusual diversity of bird habitats, including open salt water, tidal marshes and sandy beaches, fresh water lakes, streams and small swamps, road-ways dotted with farm houses, orchards and open fields, scrubby pastures and dense woods. The altitude ranges from sea level, along the edge of the water to an elevation of from two to three hundred feet on the hills immediately surrounding the inlet.

There is nothing unusual about this vicinity that would effect the decline of song in any abnormal way. Perhaps the presence of so much water, surrounded by abrupt hills renders the atmosphere somewhat more humid than usual, but the average summer temperature is about the same as is found at that latitude inland.

Systematic observations were regularly taken many times each day. Every morning from 6.00 to 7.30 was spent in the study of song, as was the time from 10.00 to 11.30, and alternate afternoons were given to the same work. A large part of the other hours of the days was spent in the open, and always with pencil and notebook in hand, recording song data. The central parts of the area were studied a little more closely than the rest, but all the remoter sections were visited at least three or four times each week, especially when they harbored birds not found elsewhere in the locality.

Three mornings a week, the half hour between 7.00 and 7.30 was devoted in a peculiar way to one of three especially favorable

points, each place being visited once a week. On these occasions a prepared sheet of paper was used, having thirty vertical columns, one for each minute from 7.00 to 7.30, and every song or call heard during that half hour was carefully recorded, in the proper column. Thus the number of species singing, and the quantity of their song, were tabulated. This gave an accurate parallel study to the notes taken during the usual observation hours, checking any false deductions.

A large chart was kept in the study to which all field notes were transferred every evening. It contained forty-one vertical columns, one for each day from July 1 to August 10, and about fifty horizontal columns, each one set apart for a certain species. All notes taken July 1, were placed in the column under that date, the items on the various birds, each inserted in the proper horizontal column. The same was done for July 2, and so forth to the end of the period studied. Every day the notations on the song volume of each species, was compared with the song volume of that bird, for the previous day, so that the progress of the decline was carefully followed. Thus when the end of the period came, by running the eye along the notes of any column, the progress of that bird's song could be determined at a glance.

As an example of the character of the notations, those on the Catbird (*Dumetella carolinensis*) are here given, taken directly from the chart, though for the convenience of the eye, the items are listed one under the other, while on the chart they were all on one horizontal column, each note in the column under the proper date.

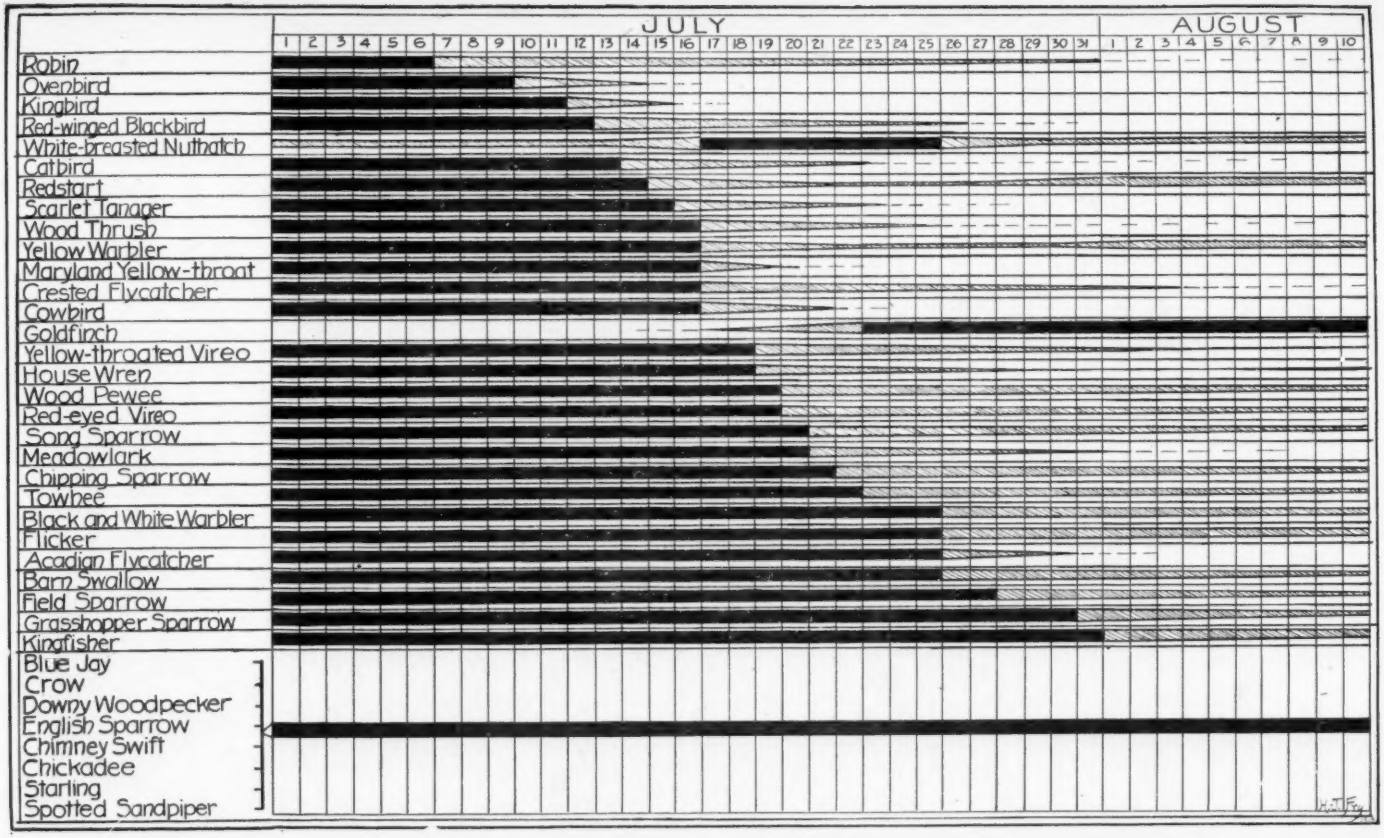
July 1 — Catbirds are in full song.
" 2 — Ditto.
" 3 — Ditto.
" 4 — Ditto.
" 5 — Ditto.
" 6 — Ditto.
" 7 — Ditto.
" 8 — Ditto.
" 9 — Ditto.
" 10 — Perhaps the songs are becoming a trifle less vivacious, though this is a question.
" 11 — About the same full volume as last week — any diminution doubtful.

July 12 — Ditto.
" 13 — Ditto.
" 14 — Intensity and frequency of song are lessening.
" 15 — Ditto.
" 16 — Ditto.
" 17 — Songs less frequent than yesterday.
" 18 — Songs have become infrequent.
" 19 — Ditto.
" 20 — At best, songs are much softer and shorter than a week ago.
" 21 — Songs are very occasional.
" 22 — Ditto.
" 23 — Songs becoming less every day.
" 24 — Nothing heard but an occasional gurgle.
" 25 — Ditto.
" 26 — Ditto.
" 27 — No song at all.
" 28 — Ditto.
" 29 — A phrase of song heard rarely.
" 30 — Ditto.
" 31 — No song at all.
Aug. 1 — Ditto.
" 2 — Ditto.
" 3 — Ditto.
" 4 — One short phrase of song heard.
" 5 — No song at all.
" 6 — Ditto.
" 7 — A single short phrase of song heard.
" 8 — No song.
" 9 — Ditto.
" 10 — Ditto.

NOTE: — The scold notes were numerous throughout the entire period.

It was immediately noticed that cold or rainy weather caused an evident depression in the songs of that day. Hence temperature, direction and strength of the wind, cloud conditions, humidity, and also the hour at which the observations were taken, as well as the exact localities visited, were daily recorded. In the final conclusions as to general song decline, local depressions caused by the weather, have been omitted, as they were of a purely temporary nature.

It would be interesting to repeat this study in the same locality for five or six successive years, keeping strict watch on the average temperature of each summer, to discover if a comparatively cool


JULY
AUGUST
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10
Robin
Ovenbird
Kingbird
Red-winged Blackbird
White-breasted Nuthatch
Catbird
Redstart
Scarlet Tanager
Wood Thrush
Yellow Warbler
Maryland Yellow-throat
Crested Flycatcher
Cowbird
Goldfinch
Yellow-throated Vireo
House Wren
Wood Pewee
Red-eyed Vireo
Song Sparrow
Meadowlark
Chipping Sparrow
Towhee
Black and White Warbler
Flicker
Acadian Flycatcher
Barn Swallow
Field Sparrow
Grasshopper Sparrow
Kingfisher
Blue Jay
Crow
Downy Woodpecker
English Sparrow
Chimney Swift
Chickadee
Starling
Spotted Sandpiper

summer caused an earlier decline than usual, or if a warmer season retarded the diminution.

The accompanying chart is a graphical presentation of the data given in this paper, showing the decline of bird song, for thirty-seven species, studied at Cold Spring Harbor, from July 1 to August 10, 1914. It will be seen that this chart is on the same plan as the one described above. The forty-one vertical columns represent the days of the period studied, and each wide horizontal line (taking the place of the notes on the horizontal columns) by its varying width indicates the song decline of a species. The birds have been arranged according to the date when the depression begins, the one affected first, being placed at the head of the list. The heavy black portions of the lines indicate maximum volume of song, and obliquely lined portions represent the days of lesser quantity. The volume of song of one species as compared with the volume of another is not taken into consideration at all, for the Song Sparrow (*Melospiza melodia melodia*) which was heard almost constantly, and the Meadowlark (*Sturnella magna magna*) which sang only occasionally, are both represented by black lines of the same width so long as they continue to sing at their maximum, which is up to July 21. After that date the narrowing lines show their decline, but there is absolutely no indication as to the relative volume of song between the two species.

At the end of the paper are several lists summing up the results. One of them contains those birds, concerning which manifestly insufficient data have been gathered, and another summer's study might show different results for some of these species. It must be remembered that the studies did not begin till the first of July, and if any of the birds commenced to decline prior to that date, the fact could only be surmised. Surely the majority were in full song at that time, and only further study, beginning in June will clear up the doubtful cases, which have also been listed.

The Robin (*Planesticus migratorius migratorius*) was heard continually during the first few days of July but a scarcely perceptible decline of song began as early as the seventh. In fact, had it been carefully studied from the middle of June, the song volume of July 1, in comparison with that of the preceding weeks, even then might have shown the first faint signs of diminution. In all probability

the decrease did not really begin till about the seventh, and from that date on through the rest of the month the decline was very gradual. There was a day or two when there seemed to be a temporary, though slight, increase, but by August 1 it was heard only occasionally, and during the last few days prior to August 10, only a few phrases were recorded now and then.

The Ovenbird (*Seiurus aurocapillus*) sang frequently up to the tenth of July, after which there was a very rapid diminution. The last song was heard on the sixteenth, though had its haunts been continually watched during the week following the sixteenth, it might have been recorded occasionally for a few days later. It is interesting to note that a full song, though softer than July's, was distinctly heard on August 7. Was this an accident, or is there a slight rejuvenation of song later in the season?

Any conclusion at all on the Kingbird (*Tyrannus tyrannus*) is but tentative as its data are not as full as for most of the other species. The song, if it may be called such, was heard occasionally throughout the first half of July and the last record is on the fifteenth. In all probability it would have been heard a good deal later had its particular haunts been more persistently studied. The call notes were numerous throughout the whole period, though they diminished somewhat during August.

The Red-winged Blackbird (*Agelaius phœniceus phœniceus*) gave its "kong-quer-quee" about the swamps till the thirteenth of July. It is a question whether or not diminution had commenced prior to July 1. After the thirteenth it was heard infrequently and the last record is the thirtieth. The sharp call notes were also noted throughout July, and as there is no record for them after August 1, their diminution seems to practically coincide with the song.

The White-breasted Nuthatch (*Sitta carolinensis carolinensis*) was noted occasionally during the first twelve days, and after that date its "yanks" were a good deal more in evidence, and this increase in call continued till about the thirtieth. After that date, and on through to the end of the period studied, it was heard in about the same lessened frequency of the early part of July.

Up to the fourteenth, the Catbird (*Dumetella carolinensis*) was heard repeatedly. After the tenth its vivacity may have lessened

somewhat, but it was a slight change at best. The diminution was rapid from the fourteenth to the twenty-fourth, and after that only an occasional gurgle or phrase of song was heard, the last record for any song at all being August 7. The scold notes were heard throughout the period.

Up to the fifteenth, the Redstart (*Setophaga ruticilla*) was heard frequently, but by the twenty-second the song had fallen off decidedly. It was noted occasionally till about the twenty-seventh, when an increase set in, and by August 2, the song was once more much in evidence and continued so, though a second decline was under way during the last few days of the period.

The Scarlet Tanager (*Piranga erythromelas*) was in full, rich song till about July 16, though further study may show this date inaccurate by several days. From that time on the song declined steadily and the last one was recorded on the twenty-seventh. The "chip-churs" were heard throughout the period.

The Wood Thrush (*Hylocichla mustelina*) was singing on every hand the first sixteen days. About the seventeenth a slight diminution was apparent which rapidly increased, and after the twenty-fifth the species was comparatively silent, though occasional, soft, short songs were heard at intervals as late as August 7. The "whit-whit" calls were heard daily.

The Yellow Warbler (*Dendroica æstiva æstiva*) began its song decline with the Wood Thrush on the seventeenth, and was heard less and less till the twenty-third, when the diminution ceased. Between this date and the thirtieth it sang occasionally and then began to increase, and by August 3 it was again singing quite frequently, though not as much as during the first part of July. It was still in this semi-revived period when the studies ceased, August 10.

The Maryland Yellow-throat (*Geothlypis trichas trichas*) started its decline with the above two species on the seventeenth, but the diminution in this case was remarkably rapid, and the last song was recorded on the twenty-second, and that performance was short and feeble.

The Crested Flycatcher (*Myiarchus crinitus*) was often heard calling in the woods through the early part of July. After the tenth the rapidly repeated roll calls became less frequent, and the

last record for one is the fifteenth. The single note whistles did not diminish till the seventeenth, and from that date they gradually decreased, but were heard occasionally throughout the remainder of the period.

Data on the Cowbird (*Molothrus ater ater*) are very scant for they were few in number. Their Starling-like calls were heard at intervals up to about July 17. Whether or not any diminution had begun before the first could not be determined, but probably not. After the seventeenth they were rarely heard and the last record is on the twenty-third.

The first song of the Goldfinch (*Astragalinus tristis tristis*) was not noted till the seventeenth of July, though in all probability it could have been heard occasionally prior to that. By the twenty-third it was singing quite frequently though at no time did it become common, and this condition continued throughout the remainder of the period. Since the decline set in some time after August 10, there are no data concerning the matter. The flight calls were heard occasionally from the beginning, and when the period of song began, they increased in frequency.

The Yellow-throated Vireo (*Lanivireo flavifrons*) remained in full song till about the nineteenth, when the diminution began which continued to the middle of the first week of August. The song did not cease altogether, however, and throughout the rest of the period it was heard almost every day, though infrequently.

The decline of the House Wren's song (*Troglodytes aëdon aëdon*) is about the same as that of the Yellow-throated Vireo. The diminution began about the nineteenth and continued till the thirtieth. The low ebb of song reached then about held its own through the rest of the period, and it was heard only once or twice each day after the last week of July.

The Wood Pewee (*Myiochanes virens*) began its decline almost imperceptibly around July 20, and from that day it gradually became less and less, though the daily diminution was scarcely evident. August 10, when the studies came to an end, it could still be heard quite frequently in sunny spots in the woods.

The story of the Red-eyed Vireo (*Vireosylva olivacea*) is almost identical with that of the Pewee, though perhaps its diminution is a trifle more marked. It too, gradually began to lessen in volume

about July 20, and the falling off continued bit by bit throughout the rest of the period. On August 10 it was singing infrequently.

The Song Sparrow (*Melospiza melodia melodia*) began to lose in volume and frequency about the twenty-first. Its decline, like that of the Pewee and Red-eyed Vireo, was very gradual, and there were days after the twenty-first when its cheering song could be heard quite often, but by August 10 it was singing only occasionally.

The data for the Meadowlark (*Sturnella magna magna*) are not as full as for most of the other species, and at best it was heard but seldom. Since only a few were seen at intervals it is difficult to determine whether or not the species was still in full song July 1. The frequency with which it sang the first week remained about constant till around the twenty-first, and after that it was heard but rarely. The last song recorded is on August 7.

The trill of the Chipping Sparrow (*Spizella passerina passerina*) began to diminish July 22. The decline was not rapid, and like the Song Sparrow, it could be heard daily throughout the remainder of the period, but each week witnessed a decided lessening, and during the last few days it was heard but seldom.

The Towhee (*Pipilo erythrophthalmus erythrophthalmus*) was heard frequently, though locally, in song and call to the twenty-third. From that date the decline set in, though gradually, and both song and call were noted occasionally, during the remainder of the period though each week becoming less.

The Black and White Warbler (*Mniotilta varia*) did not begin its song decline till July 26. The diminution was not rapid and was scarcely perceptible day by day. August 10 it was heard occasionally.

The Flicker (*Colaptes auratus luteus*) was heard calling daily throughout the entire period, though after July 25 it was not quite as much in evidence. This date marked a diminution, but a very slight one, and the calls at the close of the studies were almost as frequent as during the first week.

The calls of the Acadian Flycatcher (*Empidonax virescens*) were observed frequently, though locally, to the twenty-sixth, when a rapid decline set in, and it was last heard August 2.

Data on the Barn Swallow (*Hirundo erythrogastra*) are rather

scant. The calls did not begin to lessen till about the twenty-sixth, and from that point on the decline was gradual, and it was still heard occasionally August 10.

The song of the Field Sparrow (*Spizella pusilla pusilla*) began diminution about the twenty-eighth, though it may have started earlier as in this case the data are not satisfactory. At most it was heard infrequently all summer and only in certain regions, but after the twenty-eighth the songs became more occasional. The diminution was gradual, however, and it was heard a little each day to the end of the period.

There are also but few data on the Grasshopper Sparrow (*Ammodramus savannarum australis*). It was heard infrequently and locally to the end of July, the thirty-first probably witnessing the beginning of a gradual decline, though it may have started somewhat earlier. It was noted occasionally throughout the remainder of the period.

The rattle-calls of the Kingfisher (*Ceryle alcyon alcyon*) were heard daily throughout the entire period, though after August 1 it was not nearly so noisy.

The following eight species underwent no decline. The scold-notes of the Blue Jay (*Cyanocitta cristata cristata*) were heard occasionally each day, as were the "caws" of the Crow (*Corvus brachyrhynchos brachyrhynchos*), and the calls of the Downy Woodpecker (*Dryobates pubescens medianus*). The English Sparrow (*Passer domesticus domesticus*) was heard continually about barns, and the twitterings of the Chimney Swift (*Chætura pelagica*) were a common sound throughout the period. The Chickadee (*Penthestes atricapillus atricapillus*) put in an occasional appearance, and the Starling (*Sturnus vulgaris vulgaris*) was heard every few days. The Spotted Sandpiper (*Actitis macularia*) was heard giving its "peent" calls, whenever near its haunts. When August 10 came all of these were as much in evidence as they had been on July 1.

All of the birds thus far discussed are included in the graphical chart. The following seven were omitted as their data are scant and unsatisfactory, and further study is necessary before any conclusion can be reached concerning them.

The Black-throated Green Warbler (*Dendroica virens*) was re-

ported only six times — July 5, 9, 17, 20 and 22, and August 3. Each time the song was full and rich.

The White-eyed Vireo (*Vireo griseus griseus*) was recorded eight times — July 6, 15, 16, 20, 22, 29 and 31, and August 7. In each case the songs were full, though perhaps the last one heard showed a slight diminution.

The Phœbe (*Sayornis phœbe*) was heard but three times — July 9 and 20, and August 1, and on each occasion it was giving the "phœ-be" call repeatedly.

There are three song records for the Purple Finch (*Carpodacus purpureus purpureus*) — July 4 and 16, and August 3. The song was full on all three occasions.

The Carolina Wren (*Thryothorus ludovicianus ludovicianus*) was heard but rarely after 6.00 A.M., though in a certain locality it was heard daily in full song about 4.00 A.M., up to August 1. Since no 4.00 A. M. observations were made after that date, it is a question whether or not the early morning matins were continued. The data are not sufficiently full to allow any conclusion.

The two-note warble-whistle of the Baltimore Oriole (*Icterus galbula*) was heard throughout the period, as was the scold-note The song had declined before July 1, leaving as a residue the two-note whistle which remained about constant throughout the period, hence no statement can be given.

The Brown Thrasher (*Toxostoma rufum*) was seen a number of times, but only his harsh call-note was heard.

The list following contains those birds, included in the graphical chart, on which the observations were not quite as full as was desired, and therefore statements concerning their decline have been made with some caution:—

Kingbird
Cowbird
Meadowlark
Barn Swallow
Field Sparrow
Grasshopper Sparrow

There is some doubt concerning the following birds, as to whether or not any decline in their song had begun prior to July, first:—

(Robin)
Kingbird
Red-winged Blackbird
Cowbird
Meadowlark

The following species underwent a rapid decline:—

Ovenbird	7 days.	Maryland Yellow-throat	6 days.
Kingbird	6 " ?	Cowbird	7 " ?
Scarlet Tanager	12 "	Acadian Flycatcher	8 "

The following underwent a gradual decline:—

Robin	35 days.	
Red-winged Blackbird	18 "	
Catbird	25 "	
Redstart	27 "	plus.
Wood Thrush	23 "	
Yellow Warbler	25 "	plus.
Crested Flycatcher	25 "	
Yellow-throated Vireo	23 "	
House Wren	23 "	
Wood Pewee	22 "	plus.
Red-eyed Vireo	22 "	plus.
Song Sparrow	21 "	plus.
Meadowlark	18 "	
Chipping Sparrow	20 "	plus.
Towhee	19 "	plus.
Black and White Warbler	16 "	plus.
Flicker	16 "	plus.
Barn Swallow	16 "	plus.
Field Sparrow	14 "	plus.
Grasshopper Sparrow	11 "	plus.
Kingfisher	10 "	plus

The following had a revival of song:—

(Ovenbird)
Redstart
Yellow Warbler

The following did not reach the period of full song till near the middle of July:—

White-breasted Nuthatch.
Goldfinch.

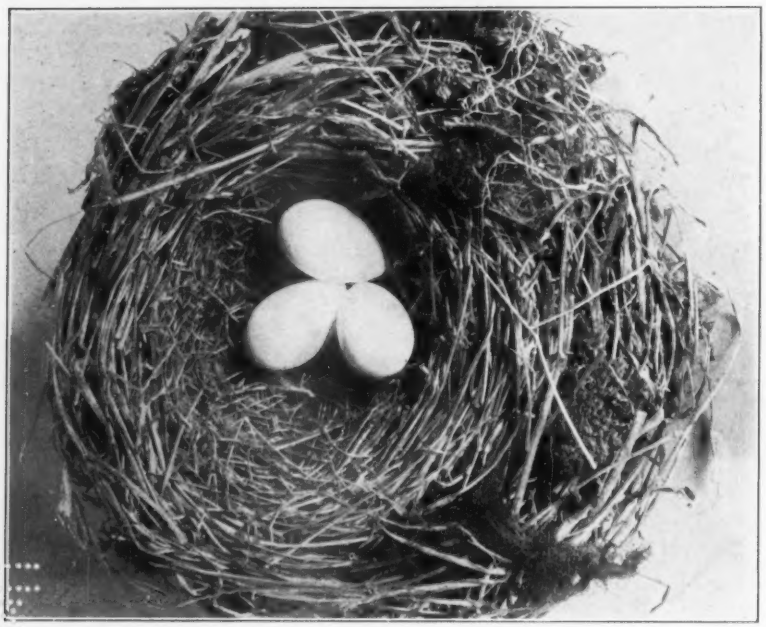
The following were singing regularly, though occasionally, at the close of the period studied, August 10:—

White-breasted Nuthatch
Redstart
Yellow Warbler

(Crested Flycatcher)
Goldfinch
(Yellow-throated Vireo)
(House Wren)
Wood Pewee
Red-eyed Vireo
Song Sparrow
Chipping Sparrow
Towhee
Black and White Warbler
Flicker
Barn Swallow
Field Sparrow
Grasshopper Sparrow
Kingbird

The following eight species underwent no decline:—

Blue Jay
Crow
Downy Woodpecker
English Sparrow
Chimney Swift
Chickadee
Starling
Spotted Sandpiper



NESTING SITE AND NEST OF THE BROWN-CAPPED ROSY FINCH (*Leucosticte australis*).

THE DISCOVERY OF THE NEST AND EGGS OF *LEUCOSTICTE AUSTRALIS.*

BY F. C. LINCOLN.

Plate II.

IT has become the pleasure of the writer to place on record the discovery of the first nest and eggs of the Brown-capped Rosy Finch (*Leucosticte australis*), known to science, together with an account of the incidents contributary to their discovery.

The work, which it was hoped would bring to light the eggs of this species, was undertaken jointly by the Colorado Museum of Natural History and Mr. William C. Bradbury of Denver, now widely known among oölogists as a patron of The Colorado Museum, through whose interest and generosity the superb collection of North American birds eggs has been placed on exhibition at this institution.

Mr. Bradbury had planned to take personal charge of the task but was disappointed through the necessity of a surgical operation, and the work accordingly devolved upon the writer, with Mr. Harold R. Durand of Littleton, Colorado, as Mr. Bradbury's personal representative, and Mr. A. H. Burns of the museum staff.

Through a former somewhat superficial experience with this species, I had become convinced of the lateness of its nesting and commenced the search from the old mining town of Alma, Colorado, on July 9, 1915. In this connection it may be noted that other arctic-alpine birds such as the White-tailed Ptarmigan (*Lagopus l. leucurus*) and Pipit (*Anthus rubescens*) had hatched their eggs at this date. No eggs of any other species were found.

The nest was discovered July 11, 1915, on the southwest exposure of the south peak of Mt. Bross, Park County, Colo., at an elevation of 13,500 feet, or within 600 feet of the summit, the elevation of Mt. Bross being 14,100 feet. This altitude of the nest site here marks the limit of plant growth, the remaining 600 feet, being bare rock, either slides or in the form of outcroppings or small cliffs.

It was in one of these latter that the nest was found, a short cliff about forty feet in height, of Lincoln porphyry, protruding through the upper edge of the schists and shales which occur just below the granite cap. The face of this cliff had suffered considerably from erosion, resulting in "chimneys" and cavities from a few inches to several feet in diameter, and in one of the smaller of these the nest was placed. The hole, forming the upper terminus of a vertical crack, ran back twelve or fourteen inches and was about forty inches from the base of the cliff.

The nest was discovered by flushing the female, which proved to be extremely solicitous, returning repeatedly despite our presence, thus affording me an opportunity to photograph her at the nest entrance. Both male and female were secured — C. M. N. H. Nos. 4723 and 4728.

The bulk of the nest was of dry grass and flower stems neatly and compactly woven together with a considerable quantity of fine moss, and lined with a fine yellow grass and a few feathers from the bird's body, with one White-tailed Ptarmigan feather. It rested well into the silt which covered the bottom of the hole, and the cup was placed to one side, thus giving walls of unequal thickness on two sides. This inequality did not, however, change the general exterior shape which is practically round measuring 4.75″ in diameter with a depth over all of 3.00″, while the cup measures 2.50″ in diameter with a depth of 1.60″.

The eggs, three in number, are pure white, slightly glossy, unmarked; ovate pyriform in shape; fresh; measurements in inches: — .91 × .60; .95 × .63; .97 × .62.

A COLLECTION OF BIRDS FROM SAGHALIN ISLAND.

BY JOHN E. THAYER AND OUTRAM BANGS.

IN the late spring and early summer of 1914, Prof. L. Munsterhjelm visited Saghalin Island, gathering there specimens of natural history of various kinds. During his stay in the island he collected about a hundred and fifty birds, at three places only, namely Sakachama, Haktshoko and Otomari, and on dates running from May 6 to July 14.

This collection was soon afterward acquired by Thayer and presented to the Museum of Comparative Zoölogy, a few skins only being retained for the Thayer Museum at Lancaster, Mass.

Prof. Munsterhjelm's choice little collection, of course, far from completely represents the ornis of Saghalin, still it contains many nice things, and adds somewhat to the knowledge of the bird fauna of that island. We therefore presume to give a full list of it.

In 1908 Prof. Lönnberg [1] published a long and very excellent account of the birds of Saghalin, the basis of his paper being a large collection made in the island by Prof. Ijima in 1906.

We have marked with an asterisk all species contained in Prof. Munsterhjelm's collection that are not to be found in the body of Lönnberg's list. Some of these are not new to the ornis of Saghalin, having been previously recorded by Nikolski in a paper written in 1889 in Russian, and are enumerated in Lönnberg's 'A List of Birds known from Saghalin, at the end of his article (pp. 60–66). A few, however, appear to be first records for the island. Even in a small collection, such as the one made by Prof. Munsterhjelm who failed to secure no end of species that were taken by Prof. Ijima, there are fourteen species that Prof. Ijima's collection did not contain. It would therefore seem, as prophesied by Lönnberg, that there are many species of birds yet to be added to the list of those found in Saghalin.

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[1] Contributions to the Ornis of Saghalin, Jour. of the College of Sci., Imp. Univ. of Tokyo, Vol. XXIII, Article 14, 1908.

Peristeridæ.

Turtur orientalis (LATH.).— One ♂, full grown but still in the immature plumage, July 8, 1914. Sakachama.

Rallidæ.

Rallus aquaticus indicus BLYTH.— Two adults, ♂ and ♀, July 7, 1914. Sakachama.

Colymbidæ.

Podiceps griseigena holbœlli REINHARDT.— Three adult females, May 14, June 6 and 14, 1914. Sakachama.

Gaviidæ.

Gavia stellata (PONTOPPIDAN).— Two specimens. A male and a female adult. Sakachama, June 10.

Laridæ.

***Hydrochelidon leucoptera grisea** (HORSFIELD).— Two adult females, May 28, 1914. Sakachama.

Mathews contends that there is an eastern subspecies of the white-winged black tern, worthy of recognition by name. He must have had access to adequate material, so we with much hesitation adopt the name he uses for this form.

We ourselves can detect no differences whatever between the present two skins and numbers of western specimens with which we have compared them. The two Saghalin skins afford the following measurements: —

No.	Sex	Wing	Tail feathers	Exposed culmen	Tarsus
66224	♀ ad.	198	67.	24	19.
66225	♀ ad.	201	68.5	23	18.5

Sterna longipennis NORDM.— Three adults, two males and a female, May 18, June 4 and June 26. Sakachama and Haktshoko.

Sterna aleutica BAIRD.— Eleven adults, nine males and two females. All taken June 23, 1914, except one male, collected June 24, 1914. Sakachama. Judged by the dates upon which these specimens were taken they must of course have been breeding.

***Larus schistisagus** STEJNEG.— One adult ♀, May 11, 1914. Sakachama.

***Larus vegæ** PALMEN.— One adult ♀, and one immature ♂, June 2, 1914. Haktshoko.

***Rissa tridactyla pollicaris** RIDG.— Two specimens, ♂ and ♀, both immature, June 26 and July 3, 1914. Sakachama.

Stercorariidæ.

* **Stercorarius pomarinus** (TEMM.).— One adult ♂, July 6, 1914. Sakachama.

Charadriidæ.

Numenius phæopus variegatus (SCOP.).— Three adults, two males and a female, May 20 and 27, 1914. Sakachama.

* **Tringa stagnatilis horsfieldii** (SYKES.).— Two adult males, May 14, 1914. Sakachama.

As Mathews suggests, eastern birds do appear to be just perceptibly paler than western ones.

* **Tringa glareola** (LINN.).— Five adults, both sexes, May 21 and 29, 1914. Sakachama.

Heteractitis brevipes (VIG.).— One adult ♀, May 16. Sakachama.

Actitis hypoleucus (LINN.).— Two adults, ♂ and ♀, July 6, 1914. Sakachama. Eastern and western specimens appear to us quite alike.

Pisobia minuta ruficollis (PALL.).— Ten adults, seven males and three females, May 15–18. Sakachama.

Pelidna alpina sakhalina (VIEILLOT).— Eight adults, both sexes, May 14 to 18. Sakachama. These skins, topotypes of the subspecies, represent a different form from the American Dunlin to which it has lately been referred by American ornithologists.

Gallinago stenura (KUHL.).— One adult ♀, May 29, 1914. Sakachama.

Lobipes lobatus (LINN.).— Two adult females, May 27, 1914. Sakachama.

Ardeidæ.

* **Ixobrychus sinensis sinensis** (GMEL.).— Two adults, ♂ and ♀, June 25, 1914. Sakachama.

These two skins agree closely with our specimens from China.

Anatidæ.

Anas platyrhynchos LINN.— Three adult females, and one young, May 11 and June 30. Sakachama.

Nettion crecca (LINN.).— Four adults, two males and two females, June 4. Sakachama.

* **Dafila acuta acuta** (LINN.).— Two adult males, May 12. Sakachama.

The American Sprig-tail has been formally separated by Reichenow, Ornth. Monbr. Vol. IX, p. 17–18, 1901, under the name *Anas acuta americana* (Bp.). The American bird is slightly different from the Eurasian, *D. acuta acuta*, besides the characters mentioned by Reichenow the American form has in the adult male plumage a longer tail. It also averages larger than the Old World Sprig.

The name *americana* is untenable if used with *Anas*, there being several earlier *Anas americana*, applied to various *Anatidæ*. Bonaparte's name, *Dafila acuta a. americana*, Compt. Rend. xliii, p. 650, 1856, just escapes being a nomen nudum, on account of the reference to *acuta* of Wilson,—the American bird, and could be used so long as the genus *Dafila* is maintained. We, however, believe that the American Sprig will have to be known by the name *Dafila acuta tzitzihoa* (Vieill.) N. D. v. p. 163, 1816, based on Hernandez. The original plate and description are both bad, but without doubt were meant to represent the Sprig which is a common migrant in Mexico.

* **Marila fuligula** (LINN.).— One adult male, May 12. Sakachama.

Falconidæ.

Pandion haliaëtus haliaëtus (LINN.).— One adult ♂, May 17. Sakachama. This skin, presents no differences, that we can detect when compared with European examples. It is, however, rather small, smaller in fact than other east Siberian examples.

Micropodidæ.

Chætura caudacuta caudacuta (LATH.).— Two adult females, June 11, 1914. Sakachama.

Cuculidæ.

Cuculus canorus telephonus HEINE.— Three adults, two males and female. June 24 to Ju y 8, 1914. Sakachama.

Picidæ.

Dryobates minor kamtschatkensis (MALH.).— One adu ♂, May 23, 1914. Sakachama. This specimen seems referable here rather than to either *amurensis* or *minutillus* of Butur in, both of which forms however, are so very poorly characterized that without much more material than is available to us we cannot b certain.

Jynx torquilla japonica BP.— Five specimens, both sexes, May 9 to June 13, 1914. Sakachama.

Hirundinidæ.

Riparia riparia ijimæ (LÖNNB.).— Eight adults, both sexes, June 10 to June 30, 1914. Sakachama.

This form, as Hartert has already pointed out, is a very strongly marked one. The upper parts are very dark, in some skins almost blackish, and the pectoral band is very dark. The pale edges of the upper tail coverts, scapulars, and feathers of the lower back and rump stand out in marked contrast against this dark ground color and give the form a very charac-

teristic appearance. We also find, as Hartert did, that while most American specimens are quite like Old World examples of true *riparia*, some (in any large series) approach *ijimæ*.

Muscicapidæ.

Xanthopygia narcissina narcissina (TEMM.).— Two adults, ♂ and ♀, June 3 and July 8, 1914. Sakachama and Haktshoko.

Turdidæ.

Turdus chrysolaus TEMM. Two adult males, July 6 and July 10, 1914. Sakachama.

These are in the white-throated plumage, referred to by Lönnberg, and thought to represent immature though breeding birds.

Luscinia sibilans (SWINH.).— One adult ♂, May 29, 1914. Sakachama. We follow Hartert in associating this species with the Nightingales rather than with the Robin Red-breasts. If a special genus is not used for it this seems to be its proper place.

Calliope calliope calliope (PALL.).— Four adults, two males, two females, June 3 to July 2. Sakachama and Haktshoko.

These specimens are all extreme of the small race, none of them approaching Kamchatkan examples in size.

Sylviidæ.

Locustella ochotensis (MIDD.)— Eight specimens, both sexes, May 27 to June 25, 1914. Sakachama.

Acrocephalus bistrigiceps SWINH.— Four specimens, all males, June 26 and July 8 and July 14, 1914. Sakachama and Otomari.

Herbivocula schwarzi (RADDE.).— One adult ♂, July 1, 1914. Sakachama.

Reguloides proregulus proregulus (PALL.).— One adult ♂, May 19, 1914. Sakachama.

***Acanthopneuste tenellipes** (SWINH.).— Two adults, ♂ and ♀, May 23 and 29, 1914. Sakachama.

Paridæ.

Periparus ater pekinensis (DAVID).— One adult ♀, May 31, 1914. Haktshoko.

Motacillidæ.

Motacilla lugens KITTL.— Five specimens, both sexes, May 6 and 7. Sakachama.

Budytes flava taivanus SWINHOE.— Eight specimens, both sexes, May 12 to June 27, 1914. Sakachama.

One adult ♂ in this series, No. 66163, has the forehead gray and the frontal part of the superciliary stripe, nearly back to the eye, white, contrasted abruptly with the yellow posterior part of the superciliary.

Anthus hodgsoni RICHMOND.— Four specimens, both sexes, May 13 to June 29. Sakachama and Haktshoko.

Alaudidæ.

Alauda arvensis pekinensis SWINH.— Six specimens, three adult males, and three young males apparently just out of the nest. The adults all taken May 9 and the young June 24. Sakachama.

Fringillidæ.

Chloris sinica ussuriensis HARTERT.— Three specimens, an adult male and two adult females. May 6, 8 and 9, 1914. All from Sakachama.

Uragus sibiricus sanguinolentus (T. & S.).— Eight specimens, both sexes, taken from May 7 to June 2, 1914. Sakachama and Haktshoko.

Emberiza aureola PALL.— Eight specimens, both sexes, May 27 to June 25, 1914. Sakachama and Haktshoko.

Emberiza spodocephala personata TEMM.— Eight specimens, both sexes, May 10 to June 24, 1914. Sakachama and Haktshoko.

We can confirm what Lönnberg has already said, with this series, the skins being inseparable from Japanese ones.

Sturnidæ.

***Spodiopsar cineraceus** TEMM.— One immature ♂, July 7, 1914. Sakachama.

Sturnia violacea (BODD.).— One adult ♂, May 27, 1914. Sakachama.

AN UNDESCRIBED SPECIES OF DREPANIDIDÆ ON NIHOA, HAWAIIAN GROUP.

BY WILLIAM ALANSON BRYAN.

WHAT will probably prove to be the last species of land bird to be recorded from the Hawaiian Islands has recently been found living in a small colony on the island of Nihoa, a small isolated remnant of rock situated in the northwest or leeward chain of the Hawaiian group, and is here noted for the first time.

For a number of years it has been my desire to visit this island, which is in reality a small remaining part of what was undoubtedly a much larger volcanic point in former time,— for the purpose of studying its geology and collecting its fauna and flora. Although I have made three round trips along the Leeward chain, as far as Laysan and Midway Islands, I have never been able to land on this forbidden spot owing to unfavorable weather conditions and the dangers which attend the making of a landing there, even in the most favorable weather. With one or two exceptions o naturalists who have visited this chain of islands have also been unable to land and have been obliged to be content with viewing it as I have done — from a distance.

It is, therefore, with much satisfaction that I am able to report that at my suggestion Captain James H. Brown, in command of the U. S. Revenue Cutter "Thetis", was able to make a landing on the island on the occasion of the April, 1915, cruise of the "Thetis" to patrol the Hawaiian Island Bird Reservation. It is from information supplied by him and the members of his crew that I am able to report that my surmise with reference to the presence of land birds on the island has proved to be correct.

Owing to unexpected heavy weather the landing party was so unfortunate as to have their whale-boat wrecked on the shore after a safe landing had been made. One member of the crew was seriously injured, but fortunately no lives were lost. Once on shore it was with much difficulty and danger that the party was able to leave the island; having to swim through the angry breakers to a second boat sent out to rescue them from their

unhappy situation. For this reason, if for no other, no specimens of any kind save a few palm (*Pritchardia remota* Becc.) seed were secured.

The only species of land bird seen by them, and the only species believed to be precinctive to the island, was a small *Drepanididæ*, undoubtably belonging to the genus *Telespiza*. This genus was established for a single species (*Telespiza cantans*) from Laysan described originally by Mr. Scott B. Wilson (Ibis, 1890, p. 341). The female of the species from the same island was described by the Hon. Walter Rothschild from Palmer's collection as *Telespiza flavissima* (Ann. & Mag. Nat. Hist., Vol. X, 1892, p. 110) two years later.

It is only for want of a specimen in hand that I withhold a new name for this bird which doubtless occurs only on the island of Nihoa and appears to be heretofore unknown and unnamed, and, moreover, to be the last of the Hawaiian avifauna liable to be discovered in the group.

Captain Brown is well acquainted with the Laysan "Finch" having seen the species at Laysan and also the colony from there that has been established on Midway Island. He believes the male Nihoa bird to be a trifle larger and perhaps yellower over the breast than are the males of the Laysan species. As Nihoa is one of the islands included in the Hawaiian Island Bird Reservation no attempt was made to secure a cabinet specimen; though specimens could easily have been collected as the birds like their Laysan cousins are exceedingly inquisitive as well as fearless. He states that specimens could be taken with an ordinary hand-net. It was estimated by the party that there are perhaps a thousand specimens of the 'Nihoa Finch' on the island.

When Mr. Carl Elschner visited the Island in 1914, for a few hours only, he was engaged chiefly in geologic and chemical investigations and made no attempt to study its fauna or flora.

The "Albatross", during the investigation of the aquatic resources of the Hawaiian Islands, was in the vicinity of Nihoa on two occasions during the voyage to the Leeward Islands of the group in 1902, but the scientists were unable to land. Dr. Walter K. Fisher in his report on the "Birds of Laysan and the Leeward Islands" (Bull. U. S. Fish Comm., Vol. XXIII, pt. III, p. 778)

says that on "June 1st we sighted Bird Island rising like a citadel into a hazy skyline and the "Albatross" came to anchor at dark off the south side. Although we could see nothing of the island, birds were in evidence by their cries. An *Oceanodroma fuliginosa* flew aboard, attracted by the glare of the deck light and on the following evening *Bulweria* and *Puffinus cuneatus* were similarly lured in some numbers.

"From our anchorage Bird Island appeared like a very steep half-funnel shaped hillside with several bold rocks and cliffs rising from the general slope. Two sulcuses, on the east and west haloes, divide the slope into three ridges and in each valley there is a group of palm trees. The peak to the west rises 903 feet. The whole of the south slope is covered with a growth of bushes and rank grass. This portion of the island suggests the half of an old crater. The west, north and east sides rise as a wall of naked rock straight and sheer to an imposing height. The west face is black and menacing and perfectly perpendicular.

"We were in the vicinity of Bird Island two days but the sea was too heavy for landing. In fact, a safe landing can be made only in very quiet weather. The shore on the south side is so rocky that even a small swell causes considerable commotion. Birds nest all over the island. Those species which love the cliff find a congenial home on the precipices and in the escarpments of the south side, while the boobies and man-o'-war birds live among the bushes on the grassy slopes. In fact, the whole mountain seemed alive with *Sula cyanops, Sula piscator*, and *Sula sula*. The last species lives along the top of the low escarpment which rises out of the sea along the south side. These three species and man-o'-war birds were continually flying around the vessel, as were likewise the various terns. We noted with pleasure *Procelsterna saxatilis*, which was common. We saw only one or two *Diomedea immutabilis* west of the island some miles, but a number of *nigripes*. Birds collected or otherwise identified are: *Sterna fuliginosa, Sterna lunata, Anous stolidus, Micranous hawaiiensis, Procelsterna saxatilis, Gygis alba kittlitzi, Diomedea immutabilis, Diomedia nigripes, Puffinus cuneatus, Puffinus nativitatis, Bulweria bulweri, Oceanodroma fuliginosa, Phaëthon rubricauda, Sula cyanops, Sula piscator, Sula sula, Fregata aquila, Charadrius dominicus fulvus, Arenaria, interpres.*"

The second visit of the Albatross was on August 5. It remained in the vicinity four days without being able to land. "Although a landing might possibly have been made with considerable risk when we first arrived, the problem of leaving the island proved scarcely reassuring, so that we had to be content with again observing the birds from a distance."

The islands of Nihoa and Necker are of interest to ethnologists as well as to ornithologists since they were visited by natives in former times in search of feathers. From the plumage of certain species they made some of the remarkable feather-work objects for which the ancient Hawaiians were famous. As the journey thither had to be made in their curious outrigger canoes, it is doubtful if it was frequently undertaken as to visit Nihoa from Niihau, which is the nearest inhabited island, entailed a journey of 120 miles over the open ocean; while Necker Island is at least 150 miles farther on in a northwesterly direction.

Nihoa is the highest island in the Leeward chain and is about a mile in length by 2000 feet in breadth which gives it an area of about 250 acres. As has been indicated it is most probably the eroded remains of a deeply subsided crater the outer slopes of which have been worn away by the sea, leaving only a portion of the volcanic bowl. The material of which it is composed is similar to that of the high islands of the group and there is evidence that it is even more ancient than Kauai.

Perhaps this hoary remnant of the past may at one time have been a stately island, like those of the inhabited group with which we are familiar. Perhaps the island has been cut off and isolated by subsidence and but this single hardy bird was able to withstand the hardships and vicissitudes through which this lonely bit of land has passed since the island was severed from a pan-Hawaiian land. At any rate, it is of interest to find here a species of *Drepanididæ* differing specifically at least, from its next of kin now living on Laysan which is at least 500 miles distant from Nihoa. It is a satisfaction to know that this rare and remote species is guarded by its rugged and isolated environment no less than by the protection afforded by having the island included in Hawaii's great bird sanctuary.

A NESTING OF THE ROSE-BREASTED GROSBEAK.

BY FRANCIS H. ALLEN.[1]

IN the spring of 1914 I watched a nesting of the Rose-breasted Grosbeak (*Zamelodia ludoviciana*) in West Roxbury, Mass., and though my notes are not so complete and detailed as I could wish, they are perhaps worth recording, and I offer them for what they are worth.

On May 23 I observed a female Grosbeak building in the top of a pear tree which stands about twenty feet from a veranda of my house. The nest, which was only just beginning to take shape, was in plain sight from our upper windows. From that time till incubation began the male bird was never seen at the nest, though he often sang near by. I think he took no part in the building. The female had a habit of uttering a few high-pitched and faint notes, rather prolonged, *ee ee ee*, while on and about the nest. They were, perhaps, addressed to her mate, though he seemed never to respond in any way, and, in fact, during this period of nest-building I never saw him near when these notes were uttered. It is hard to see of what value such a habit could be to a bird, for the notes would serve only to betray the presence of the nest; but they impressed me as a sort of crooning of satisfaction over the preparations going forward,— though the word crooning would not apply to the quality of the notes, which were high-pitched, as stated.

On May 28 I saw the bird moving about on the nest and judged that it was completed. As I did not go up to the nest at this period, I do not know just when the eggs were laid, nor did I note just when incubation began, but on June 7 the birds had been sitting for several days. The male assisted his mate in the work of incubation, but the female appeared to do most of it. The male took his cares lightly and sang habitually while incubating. The song thus given was shorter and less loud than the ordinary song of the species, but, though somewhat subdued in tone, it was not identical with the very soft and subdued song which is sometimes heard from

[1] Read before the Nuttall Ornithological Club, December 7, 1914.

this species and which is, I think, generally if not always more prolonged than the ordinary song. It began with three or four repetitions of a phrase like *tĭ'wee* and concluded with a warble. The female *hicked* a good deal on the nest, but for some time I did not hear what I have called the "crooning" notes.

On the afternoon of June 14 I watched the nest for a time from the ground below and at a short distance.

At 2.20 the male sang at the nest and was relieved by the female.

At 2.33 the female called *ee ee ee* (the "crooning" note) and was relieved by the male.

At 2.42 the male sang.

At 2.43 he sang again and was relieved by the female. The male called *ee ee ee* as he flew off. I think this was the only time I heard this note uttered by the male.

At 3.07 the female flew off with *ee ee ee*. Probably the male approached the nest at the same time and without my seeing him from where I sat, for, after waiting some time for him to appear, I went to the upper veranda and from there could see him perched on the edge of the nest, shading it with wings half spread. This was at 3.29.

At 3.34 the male sang and was promptly relieved by the female. A single *ee* was uttered by one of them. The female at once began feeding young, and this was the first intimation I had had that the young had hatched. They must have hatched that day, for on the day before, and I think on the morning of that day (June 14), the parents appeared to be still sitting.

On June 18 I noted that the young, of which there were three, were covered, or partly covered, with a whitish down which stood out from the body and up from the top of the head. They had a fine, high, rather sweet *hū'ee* with a slightly husky quality, which they uttered while being fed. I have heard this same note, but louder, uttered by a fully fledged bird, possibly an adult female (July 29, 1908).

On June 20 the note of the young was louder and usually a plain, unmodulated *hū*, though occasionally there was a suggestion of the rise in pitch at the end. Once or twice I heard a quavering *hū' wĭ-wĭ*. The young then cried before the mother came to the nest as well as while being fed. The female took the entire care of

the young, and after the 14th, when the young were just hatched, I never saw the male at the nest. For several days he had sung but little, but on the 20th he recovered his volubility and sang long and loud and frequently. On the next day he was still voluble.

On June 22 I went up to the nest to band the young birds. One of them flopped out as I reached up to the nest from the ladder, and fell fluttering to the ground, where it landed on its back and lay motionless. When I reached it and picked it up it remained motionless in my hand, but did not appear to be dead or dying, and I concluded that it was "playing possum." I banded it and put it back in the nest, where it stayed quietly. Another of the young, which I banded, also "played possum." I could not find the third young bird by feeling about,— the nest was above my head,— and I think it may have disappeared, or possibly it was underneath the other two. I refrained from poking about in the nest much for fear of hurting the young.

While I was at work at the nest, the female kept up an anxious *hick*-ing near by and at one time uttered a rapid succession of frantic *hicks* within a few feet; but the male sang cheerfully through it all and appeared not to notice what was going on. One may imagine, of course, that he was merely trying to reassure his mate or keep up her courage. He was especially voluble that morning, particularly early in the morning, before I went up to the nest, when his songs were unusually long and succeeded one another with only very short rests between.

On June 24, two days later, the male, which had been as voluble as ever the day before, was not heard at all, and as the nest appeared to be deserted, I went up to it and found it empty except for a dead young one, one of those that I had banded and probably the one that had fallen. Later I heard a surviving young one calling about a hundred yards off, and saw the mother, which answered her offspring with the familiar *hick* note.

I took the nest, which hung together remarkably well, considering the apparent looseness of its construction, and was easily removed intact. It is difficult to assign any precise dimensions to it, on account of its straggling character, but it may be called eight inches in external and three and one-half inches in internal diameter, and about four and one half inches deep externally and

two inches internally. It was composed of slender twigs of various kinds, the exterior largely dead hemlock twigs, which from their roughness held together well and kept the structure intact. The lining was of finer twigs, largely spiræa from the garden. The nest was set in a crotch near the top of the pear tree and about seventeen and one half feet from the ground.

Summary.

Summarizing these observations, we find that the female bird built the nest, apparently without help from her mate; that the male assisted in incubation and habitually sang while on the nest, the song seeming to be sometimes, if not always, a signal to the female that he was ready to be relieved; that the male appeared to take no part in the feeding of the young; that the female had a special note which she uttered when about the nest and sometimes, apparently, as a signal that she was ready to be relieved from her duties,— a note that was rarely uttered by the male; that the young, as is the case with most birds, had a peculiar note of their own, a food-call, which changed as they developed; and, finally, that young Rose-breasted Grosbeaks should be banded not later than a week after hatching if the risk of frightening them out of the nest is to be avoided.

FIVE YEARS PERSONAL NOTES AND OBSERVATIONS ON THE BIRDS OF HATLEY, STANSTEAD COUNTY, QUEBEC — 1911–1915.

BY H. MOUSLEY.

As far as I have been able to gather very little if anything has been published on the birds of this particular part of the country, and it may be well therefore to give some indication as to the exact location of Hatley and the County of Stanstead, of which the former forms one of the northern divisions. Looking at the map the county of Stanstead will be found stowed away as it were almost in the extreme southeast corner of the Province of Quebec; the southern border adjoining the State of Vermont, whilst the nearest point on the eastern side is within ten miles of the borders of New Hampshire, and thirty of Maine. The entire county comprises an area of about 410 square miles or 263,000 acres. Few parts of the country present a greater variety of surface than Stanstead County. The land on the eastern shore of Lake Memphremagog (a large sheet of water some 33 miles in length and from one to three miles in width) and extending through Hatley on the west side of Lake Massawippi is hilly and broken, the most prominent elevations being the Bunker and Massawippi hills, the latter rising to about 1400 feet above the sea level. The courses of the four principal rivers, the Barlow, Negro, Coaticook and Massawippi (none of which are of any great size or importance) are marked by uneven banks and hilly ground which generally extends for about a mile on each side. The three first have their source in the State of Vermont from which they flow in a northerly direction, the Barlow and Negro on the left hand side of the county and the Coaticook on the right side, the two former emptying themselves into Lake Massawippi at its southern extremity and being conveyed away at the northern end by the Massawippi river; which after flowing in a northeasterly direction for about eight miles joins the St. Francis near Lennoxville the same as the Coaticook river does on the east side, and thus the waters of these four rivers eventually find their way into the St. Lawrence by means of the St. Francis,

about midway between Montreal and Quebec, this waterway, no doubt, forming at least one of the minor highways of migration if not a principal one. The greatest elevation in the eastern part of the county is Barnston Mountain. In many places the surface is undulating and resembles the rolling prairies of the west, with no prominent hills. With the exception of some marshy ground and about 800 acres known as the "Burnt District," both near Lake Massawippi there is but little waste land in the county, the greater part of the hilly ground being adapted to cultivation or pasturage.

The soil in its native state was highly fertile and productive, the hills and higher grounds being covered with a heavy growth of maple, beech, birch, hop hornbeam, and white ash, whilst the lower grounds produced elm, basswood, cherry, butternut, poplar, hemlock, spruce, pine, cedar, fir and tamarack, but in their mistaken idea that the strength of the soil would always continue, the earlier settlers devastated the County of most of its valuable timber, until at the present day many of the farms have barely sufficient trees left for firewood and building purposes and to form sugaries. The County is divided into five townships, of which Hatley forms the principal northern one, the village being situated between latitude 45° 10′ and 45° 12′ north and longitude 71° 55′ and 71° 57′ west, and deriving its name from a village in England, no doubt that of East Hatley in the Diocese of Ely Cambridgeshire. The survey determining its original boundary was made in 1792 and subdivision into lots in 1795 and by 1815 it had become a place of some little business and importance, but now owing to the fact that the nearest railway station is between three and four miles away, the business done in former days when railways did not exist, has been removed to other towns and villages adjacent to the centers of transport. Owing to this lack of a railway, however, the village at the present day retains most of its original charm and beauty. It lies at an elevation of about 1000 feet above the sea level, and almost through its entire length there runs a fine avenue of maple trees. On the east it is backed by some hilly and well wooded ground rising 350 feet or more above the level of the village, whilst to the north and west the ground after rising for some distance falls away gradually until it reaches the level of Lake Massawippi, a fine sheet of water nine miles in length, with an average

width of about a mile. This lake together with that of Magog a little further north, and Lake Memphremagog to the south, are the three principal sheets of water in the County, affording excellent fishing at times, as well as a resting place for large flocks of ducks in the autumn. In years gone by the St. Francis tribe of Indians used to visit Lake Massawippi (even after the advent of the white settlers) for the purpose of fishing, trapping mink, coon, otter and beaver, etc., as well as hunting moose and deer, all of which were then found in abundance, but most have long since disappeared with the march of civilization! On the south side of the village runs the main road to Stanstead, the country assuming more of a level aspect with Bunkers hills in the distance on the right whilst the high rising ground on the east side of Hatley, extends for some considerable distance in the direction of what is known as Barnston Mountain. The district all round Hatley is entirely an agricultural one, dairy farming, hog raising, and the maple sugar industry forming the farmers' principal source of income. In addition to the maple trees there still remains a fair sprinkling of elm, beech, birch, cherry, butternut, poplar, hemlock, cedar, fir, pine and tamaracks, which with numerous small streams and the undulating nature of the country, form an excellent home for the various breeding birds, and resting place for the migratory ones that visit the district.

Although the list contains some 122 species, 63 of which have actually been found breeding (besides another 17 some of which are known and others believed to breed more or less frequently, but whose eggs have not yet been found), it must not be assumed that it is by any means complete, as very little has been done with regard to the Hawks and Owls, most attention having been paid to the Sandpipers, Sparrows and Warblers.

The position of Hatley makes its avifauna interesting lying as it does at the mouth of a "cul de sac" so to speak of the Canadian Zone, which has its termination in the States of Vermont and New Hampshire, with spurs of the Transition zone extending north on each side of it, the one on the right hand into southern Maine to about latitude 45°, whilst that on the left extends still further north, or to about latitude 47°. It follows naturally that the fauna is chiefly Canadian with a good deal of Transition or Alleghanian,

and a slight sprinkling of Hudsonian. Of the Canadian species such characteristic ones as the White-throated Sparrow and Winter Wren are getting very near their extreme southern breeding limits, whilst of the Transition forms, Hatley apparently, lies outside the regular breeding area of the Sora, Indigo Bunting, Red-breasted Grosbeak and Cowbird, the latter of which until the present summer (1915) was almost unknown even as a transient visitor.

In that charming book the "Birds of Maine" Mr. Ora W. Knight, on page 507, speaking of the Myrtle Warbler says, "The scattered flocks pass on leaving here and there a pair of mated birds, in many instances individuals being found frequenting the very same localities from year to year under conditions which would almost warrant the assumption that the very same individual birds had returned to their summer homes." With regard to this most interesting subject I will say that my five years' observations over a restricted area (mentioned hereafter) have more than "almost warranted" as the late Mr. Knight says, the assumption, they have entirely convinced me of the fact that the very same birds do come back year after year to the site endeared to them by the previous year's associations. If this is not so how can the following instances be lightly put on one side and explained away. In May, 1914, in a particular corner of the marsh I took a set of Swamp Sparrow's eggs, of a very handsome type, differing from any other set in a most marked degree. Visiting the same locality the following year I flushed a bird from another set of eggs, almost identical to those of the previous year. Again a set of Spotted Sandpiper's was taken on May 20, 1912, the earliest set ever found, and much below the average size, being in fact the smallest set I have ever seen or can hear of, the average dimensions being 1.18× .92 in. only. In the following year on the same side of the marsh and not far from the other nest, I found on May 25 (also the earliest date for that year) another set identical in size, 1.19 × .91 in., shape and markings, to that of the previous year. Finally a set of the White-throated Sparrow was taken in May, 1914, on the outskirts of a small damp wood, the birds building another nest almost at once close by, under the drooping branch of a small cedar bush, which I did not molest.

Visiting this same bush the following year another nest was

found within one inch of the other, in fact it was only the bough of the branch resting on the ground that divided the two nests. Am I in this case to believe that a strange pair of birds not only selected this same wood, but also the same part of it, and moreover the very identical bush in it, and spot under that bush, to build their nest in, if so; then I can only say it seems to savour of the uncanny. If space permitted I could enumerate many other similar instances to the above, with regard to the Myrtle Warbler, Robin, Chipping Sparrow, Bluebird and others. Of course I do not believe that in every case both birds can return, in some no doubt they do, in others it may be the male or female only, but which ever it is, that one, after selecting a new mate, will no doubt lead him or her as the case may be to the locality of the old nesting site. At all events this is the light in which I prefer to look upon it, leaving others to enjoy their own views on a subject, which, after all, is perhaps too deep for any of us to fathom with certainty.

In conclusion I may say that nearly all of my records have been made on some six farms (the smallest of which only some 75 acres in extent has produced 100 out of the 122 species enumerated and 47 of the 63 breeding records) one and one half miles south of the village consisting of about 1000 acres, on which is situated the little marsh so often referred to, especially in the case of the Sandpipers as "the marsh." This was originally a wood through which a small stream flowed, and lying in a natural hollow it was an easy matter, when the timber was cut down, to form a dam at the lower end and thus spread the water from the stream and surrounding sloping ground, over a surface of about 15 acres. In the summer time owing to the little rainfall and a bad leak near the dam the water level gets very low, leaving large beds of silt and mud exposed, with patches of cat-tails, forming an excellent feeding ground for marsh and shore birds, so much so that although there are several other small marshes in the neighbourhood, none of them present anything like the attraction that this one does (owing to its especially large mud beds) at all events to the Sandpipers, very few of which I have found anywhere else. The following synopsis will show at a glance to the best of my judgment the number in each order, and status of the 122 species enumerated in the text.

Order	Residents No. of Species	Summer Visitants No. of Species	Winter Visitants No. of Species	Transients No. of Species	Breeding, nests & eggs actually found No. of Species	Known, or believed to breed but no eggs found No. of Species
Anseres				4		
Herodiones		1		1	1	
Paludicolæ		1		1	1	
Limicolæ		2		10	2	
Gallinæ	2				1	1
Raptores	1	2		6		3
Coccyges		1		1	1	1
Pici	3	2			4	1
Macrochires		2		1	1	1
Passeres						
Sparrows		7		3	7	
Wood Warblers		13		4	10	3
Flycatchers and others	4	35	5	10	35	7
	10	66	5	41	63	17
			122 species			

1. **Anas rubripes** (Brewster). BLACK DUCK.— Common transient; (April 11) Aug. 6 to Oct. 17; (Nov. 25). Average date of arrival (for two years) Aug. 15; of departure (for two years) Oct. 14. Small flocks of this duck usually visit the marsh during the months of August to October, the date in April being for a pair only, and that in November for a single. They fly high as a rule with no fixed formation, and are very wary and difficult to approach when settled on the water. The total number of birds observed during the fall of 1914 was 95, the largest flock consisting of eighteen, as against 21 for the present year with a total of 93 birds.

2. **Nettion carolinense** (Gmelin). GREEN-WINGED TEAL.— Rare transient; Oct. 11. The above date of the present year, 1915, is the only one on which I have shot (or seen to identify) an example of this smallest of ducks, although on April 18 of this same year, I have an entry in my note book as follows, viz: "Small duck seen in the distance probably a teal?" I feel pretty sure now that it was one of this species. The present one was a female and alone, and when weighed just turned the scales at thirteen ounces.

3. **Chen hyperborea nivalis** (Forster). GREATER SNOW GOOSE.— Rare transient; April 6. A flock of fifteen of these fine birds passed over in the afternoon of the above date, 1914. They were heading north spread out in a gentle curve, and not in a sharp defined V shape. As no specimen was obtained I have adopted the generally recognized rule, that birds passing

to the breeding grounds in the far north by way of the eastern side of the Mississippi valley, belong to this species and not to the Lesser Snow Goose.

4. **Branta canadensis** (Linnæus). CANADA GOOSE.— Common transient; April 25 to May 2; Oct. 16 to Nov. 25. Flocks of from 20 to 30 of these geese can usually be seen both during the day and night, heading either north or south as the case may be, and generally spread out in a well defined V shape.

5. **Botaurus lentiginosus** (Montagu). AMERICAN BITTERN.— Fairly common summer visitant; April 24 to Sept. 29. Average date of arrival (for four years) April 27; of departure (for three years) Sept. 28. Eggs: May 29 to June 14. A pair of bitterns visit the marsh every year, but I have only succeeded in finding their nest on two occasions, the eggs on June 14 being heavily incubated, and hatching out some few days later. Of all the ugly little spitfires young bitterns beat anything I have ever seen. I suppose I must consider myself lucky in having been able to watch a male bittern boom for nearly half an hour, although the spectacle was not very edifying, reminding one somewhat of a person in the throes of seasickness. However, I suppose his lady love thought otherwise, and no doubt was duly impressed by the ceremony.

6. **Ardea herodias** (Linnæus). GREAT BLUE HERON.— Fairly common transient; April 19 to May 31; July 25 to Nov. 13. Average date of arrival (for four years) April 26; of departure (for three years) Nov. 8. One or two of these handsome birds can be found at most times on the marsh during the above dates.

7. **Rallus virginianus** (Linnæus). VIRGINIA RAIL.— Rare transient visitor; July 22 to 24. On the first of the above dates in the present year (1915), I saw (and shot for identification) my first example of this rail, and on the latter date saw another in about the same place, on the edge of the reeds, which no doubt was its mate.

8. **Porzana carolina** (Linnæus). CAROLINA RAIL OR SORA.— Rare summer visitant; May 23 to Oct. 12. Eggs: July 22. Up to July of the present year (1915) I had only seen two examples of this rail in October, and it was with much surprise therefore, whilst walking through a bed of cat-tails in the marsh on the above date in July, that I came across a nest containing six young birds which had just hatched and two addled eggs, which latter I was able to preserve as cabinet specimens. The nest was composed entirely of old dry cat-tail leaves, and when found the top was five and one half inches above the surface of the ground, upon which it rested, the water in the marsh being nearly all dried up at this date. There was a well defined approach from the ground to the summit of the nest, but apparently no canopy.

9. **Philohela minor** (Gmelin). AMERICAN WOODCOCK.— Rare transient; May 7 to 10. After three years repeated failure to find any traces of this bird, I flushed one on the first of the above dates in 1914, from underneath a cedar tree, and came upon it again three days later, whilst it was standing dozing at the edge of a little alder run, not far from the spot where I first put it up.

10. **Gallinago delicata** (Ord). WILSON'S SNIPE.— Fairly common transient; (Aug. 30, Sept. 14, 20); Oct. 2 to Nov. 9. The usual date of the fall arrival here seems to be about the first, or beginning of the second week in October, only a single bird in each case having been observed on the dates in August and September. During the fall of 1914 I counted thirty-nine between the above dates in October and November, as against only about a sixth of this number for the corresponding period of the previous year; fourteen being the greatest number seen in a single day. This year 15 examples have been noted. I am unable to give a spring date not having yet observed the bird at that season.

11. **Pisobia maculata** (Vieillot). PECTORAL SANDPIPER.— Fairly common transient; July 22 to Oct. 21. I have only seen thirty-five examples of the Pectoral Sandpiper so far, two in July, five in August (one of which was in the company of two Lesser Yellow-legs), fourteen in September, and fourteen in October, most of which latter were feeding with Wilson's snipe. At times they are not at all shy, and I have watched them feeding on several occasions within quite a short distance. In this species the males, contrary to the general rule amongst the Sandpipers, are the larger, one I shot weighing five ounces and taking just two females to balance the other side of the scales. They make excellent eating when properly cooked like snipe. I am unable to give a spring date, not having yet observed the bird at that season.

12. **Pisobia minutilla** (Vieillot). LEAST SANDPIPER.— Common transient; May 23 to June 2; July 10 to Sept. 4. Of all the Sandpipers enumerated this is the most abundant, as I find from my notes that during the past and present year (1915), 114 examples have been seen, and with four exceptions (three of which numbered between twelve and eighteen and the other twenty-five) they did not exceed six in a flock, and on many occasions singles only were observed. In the case of this species as well as in that of all the other shore birds observed here, the autumn migration produces by far the greatest number of birds.

13. **Ereunetes pusillus** (Linnæus). SEMIPALMATED SANDPIPER.— Fairly common transient; May 23 to 29; July 22 to Sept. 4. This elegant little Sandpiper is not nearly so plentiful as the Least, in fact I have never seen a flock composed entirely of them, they were always in the company of the latter. By carefully examining these mixed flocks and taking the same dates as mentioned in the account of the Least Sandpiper, I find only thirty-five were observed as against the 114 of the latter, thus giving a proportion of about three to one.

14. **Totanus melanoleucus** (Gmelin). GREATER YELLOW-LEGS.— Rare transient; May 11 to 12; Aug. 3 to Oct. 24. Judging from the few examples seen of this bird, one in the spring and eight in the fall, it is not unreasonable to suppose that they are merely stragglers, and that Hatley lies outside the usual line of migration. When disturbed I noticed these birds had a habit of alighting on dead tree stumps (of which there are many in the marsh) where they would remain for long periods at a time, and from

which no doubt they were better able to keep a sharp lookout for any approaching danger.

15. **Totanus flavipes** (Gmelin). LESSER YELLOW-LEGS.— Rare transient; July 9 to Aug. 10. I have only seen seven examples of this bird so far, four in July and three in August, so that no doubt Hatley, as suggested in the case of the Greater Yellow-legs, lies outside the general line of migration. When disturbed these birds only gave vent to a single "wheu" as against the three uttered in succession by their cousin the Greater Yellow-legs, whose notes are also louder and harsher. I have never seen them alight on anything but the ground.

16. **Helodromas solitarius** (Wilson). SOLITARY SANDPIPER.— Common transient; May 9 to 31; July 18 to Oct. 21. Average date of arrival (for three years) May 19; of departure (for two years) Oct. 7. On a few occasions only have I seen this Sandpiper in the company of others, and then generally the Least was its companion. It is particularly fond of wading about in the water up to its belly, but only on two occasions have I seen it swim. On the first of these a bird deliberately waded out of its depth, and then took to swimming about for half a minute or so, in the most matter of fact way, and on the second a wing tipped bird swam half way across the marsh before being able to reach a little mudbank on which it alighted. During the past two years I have observed seventy of these birds, the largest number seen together being six on one occasion only, whilst three, four and five have been noted several times. Only once have I seen it alight on the top of a tree stump, the ground or a log in my experience being the usual place. I see no reason why some day they should not be found breeding here, as the ponds they frequent with the surrounding woods seem likely enough places.

17. **Bartramia longicauda** (Bechstein). BARTRAMIAN SANDPIPER.— Rare summer visitant; May 10 to Aug. 20. Eggs: May 24. It was on the 24th of May, 1913, that I received word of a bird of this species, having been shot at close range, as it rose suddenly from the ground late the previous evening. Naturally I was not long in visiting the farm, which was only some few miles away, and being shown the field and place near where the bird had risen, I soon came across the nest, which was a natural depression in the ground in the centre of a bunch of buttercups, lined with dry grasses only, and contained a beautiful set of four evenly spotted eggs (average size 1.72×1.23), one being of a much lighter ground colour than the other three. The following year I was again notified that a pair of birds were about, but on the only two occasions on which I was able to visit the locality, I failed to locate their nest, although I have every reason to believe, they brought up a brood, as they were seen and heard several times again during the remainder of the summer. During the present year (1915) a parent bird with young was seen by two parties in the same district in which my set of eggs was taken, although at somewhat widely different points, so that possibly the breeding area and number of birds is larger than I imagined. However this may be, I look upon it as quite

my most interesting find, especially in view of the fact that during the past few years its numbers are considered to be increasing in northeastern United States, and let us hope in eastern Quebec also.

18. **Actitis macularia** (Linnæus). SPOTTED SANDPIPER.— Common summer visitant; May 1 to Sept. 24. Average date of arrival (for five years) May 4; of departure (for three years) Sept. 10. Eggs: May 20 to June 21. Usually not less than six pairs of this familiar little sandpiper breed on the margins of the marsh, and one of the most interesting events I have witnessed happened with regard to this species. I had shot an immature bird (for a cabinet specimen) which fell at the edge of the water, but on proceeding to the spot to pick it up as I thought was surprised to see it wading out in the water, where after getting out of its depth it sank to the bottom, and I could see it there in the clear water proceeding at a great pace by means of its wings and feet for a small mud bank, where it came to the surface and hid in the surrounding rushes. Persistent searching in late June and through July has failed to reveal any evidence of a second brood. Three eggs in a set are rare, only one out of fifteen nests examined having this number all the others containing four. On one occasion only have I seen a very excited parent bird with young alight on a cat-tail head, and very out of place and uncomfortable it seemed to be. It may not be generally known that these birds if flushed whilst constructing their nest invariably desert it, at least this has been my experience on four occasions, when I have flushed both birds whilst in the act of scooping out or lining the hole. In one instance, however, they made a fresh nest within forty-five feet of the old one. Most of the birds leave about the end of July or beginning of August, those remaining into September being immatures only.

19. **Oxyechus vociferus** (Linnæus). KILLDEER.— Rare transient; July 31. The above date of the present year (1915) is the only occasion on which I have come across this handsome plover, and then only one was seen feeding by itself on the edge of the marsh. By careful stalking and hiding in the cat-tail beds I was able on two occasions to get quite close to it.

20. **Ægialitis semipalmata** (Bonaparte). SEMIPALMATED PLOVER.— Rare transient; May 23 to 28; July 22 to Aug. 16. It is only during the present year (1915) that I have come across this pretty little plover, and then only fifteen examples have been noted between the above dates, the greatest number seen together being four on two occasions. In three cases they were alone and in the other five Least and Semipalmated Sandpipers were their companions.

21. **Canachites canadensis canace** (Linnæus). CANADIAN SPRUCE GROUSE.— Rare resident. This is decidedly a rare bird in the immediate vicinity of Hatley. I have never shot or even seen one (during the past five years) until the evening of Oct. 21 of the present year, 1915, when a female was shown to me in the flesh that had been shot in the morning.

22. **Bonasa umbellus togata** (Linnæus). CANADIAN RUFFED GROUSE.— Common resident; Eggs: May 15 to 30. As far as my observations have gone for the past five years, this fine game bird has remained

in "status quo" neither increasing nor decreasing. It is by no means plentiful at any time but judging from the number of broods seen earlier on, the present season, 1915, should prove to be above the average. Nests usually contain from eight to ten eggs, only on one occasion have I found as many as thirteen. In some cases it is not unusual for a few eggs in a set to be spotted, but I have a unique one of ten in which every egg is well spotted, not at the larger end as is usual but at the smaller, an uncommon occurrence even in the case of a single egg of any bird. I have never had the good fortune to catch a male in the act of drumming, although I have known of several drumming logs.

23. **Circus hudsonius** (Linnæus). MARSH HAWK.— Common summer visitant; April 14 to Oct. 17. Average date of arrival (for four years) April 18; of departure (for four years) Sept. 22. Although a pair of these birds have frequented some low lying overgrown marshy meadows for the past four summers, I have been unable so far to locate their nest, but have seen the young later on in the season hawking over the locality in company with the parent birds.

24. **Accipiter velox** (Wilson). SHARP-SHINNED HAWK.— Rare transient; May 3, Oct. 21. This little hawk must be rare in the district for the above dates of the present year (1915) are the only ones on which I have seen examples, notwithstanding I have invariably rapped on every evergreen tree containing a likely looking nest, in the hope of putting one up during the breeding season. When seen the one in May was flying low down and gave me a good view of its long square ended tail, the other in October was that of a male shot in the morning and shown to me in the flesh a few hours afterwards.

25. **Astur atricapillus atricapillus** (Wilson). GOSHAWK.— Rare transient; Oct. 21. The above date in 1914 is the only one on which I have seen an example of this hawk. It was an adult bird in fine plumage and was shot near a sugar house in some woods early in the morning and shown to me the same evening.

26. **Buteo borealis borealis** (Gmelin). RED-TAILED HAWK.— Rare transient; Oct. 29. The only example I have seen of this hawk was that of a fine adult bird which (contrary to its general custom) had been robbing a hen yard, and was eventually caught in a trap on the above date, and shown to me alive the same day.

27. **Buteo lineatus lineatus** (Gmelin). RED-SHOULDERED HAWK.— Common summer visitant; March 28 to Oct. 25. Average date of arrival (for three years) March 29; of departure (for three years) Oct. 21. This is undoubtedly the commonest of the large hawks in this district, and at least four pairs nest in the surrounding woods, although not having given much attention to them as yet, I can only record having actually found one inhabited nest which contained young. On one occasion I witnessed a pair of Kingbirds who had a nest in some drowned land on the outskirts of a large wood so mob and terrify a young hawk of this species that it seemed to lose the power of flight, and floundered about in the water until it became a most

miserable and bedraggled object, and it was not until the Kingbirds had left him that he ventured to essay a short flight on to a stub, where he dried his wings, and at intervals uttered shrill cries as if invoking his parents to come to his aid.

28. **Haliæetus leucocephalus leucocephalus** (Linnæus). BALD EAGLE.— Uncommon transient; Aug. 1. A specimen of this fine eagle was shot on the above date in 1914, on a farm just outside Hatley village, and was set up by a local taxidermist. I have since had the pleasure of seeing the bird and found it to be an immature one in fine plumage. It weighed seven and one half pounds so I was told, and the spread of its wings was seven feet.

29. **Falco columbarius columbarius** (Linnæus). PIGEON HAWK.— Rare transient; Oct. 5. The above date of the present year (1915) is the only one on which I have seen an example of this little falcon. When first seen it flew just over my head (whilst I was in a cat-tail bed in the marsh after snipe) in hot pursuit of a small bird, and I was afterwards able to get quite close to it while perched on a dead tree on the lookout for further quarry.

30. **Pandion haliaëtus carolinensis** (Gmelin). OSPREY.— Rare transient; May 3 to 5. Average date of arrival for two years May 4. During the above dates in May of this (1915) and last year, a pair of these birds have visited the neighbourhood and remained to fish in the waters of the marsh, where at intervals they could be seen dropping like an arrow, generally rising with a fish in their talons.

31. **Strix varia varia** (Barton). BARRED OWL.— Fairly common resident. Although I have only actually seen this Owl in the flesh on five occasions in April, October and November, its hooting has been beard in almost every month of the year, and for this reason I think it may be safely included under the above heading. I often regret the want of a younger companion who would help me work up the Owls and Hawks, as there must be many more species than I am able to record at present.

32. **Coccyzus erythrophthalmus** (Wilson). BLACK-BILLED CUCKOO. — Fairly common summer visitant; May 26 to Aug. 27. Average date of arrival (for four years) May 29. Eggs: June 12 to 21. This is by no means a plentiful bird and during the summer of 1914, I was unable to locate a single nest, and only saw it on two occasions, both of which were in July. Of the five nests found so far none were placed at a height of more than seven feet above the ground, and all but one were lined with willow catkins, the contents in every case being a set of three eggs, one set containing a runt egg, size .87 × .71.

33. **Ceryle alcyon** (Linnæus). BELTED KINGFISHER.— Fairly common transient; May 3 to 22; July 19 to Oct. 7. Average date of arrival (for four years) May 11; of departure (for two years) Sept. 30. Every spring a pair of these birds frequent the marsh during May, and can generally be found perched on a stump or fence rail, from which at intervals they rise into the air preparatory to plunging down on some unsuspecting fish that

has caught their eye. In the fall they return again but strange to say never accompanied by any of their brood.

34. **Dryobates villosus leucomelas** (Boddært). NORTHERN HAIRY WOODPECKER.— Fairly common resident. Eggs: May 28. With the exception of the Pileated this is the rarest of the woodpeckers, being somewhat uncommon at all times, and only nesting so far as my experience goes in woodlands. As a rule the nest hole is somewhat high up but on one occasion I found one which was only three feet above the ground in a birch stub, containing four eggs, the entrance hole being two inches in diameter, extreme depth eleven inches and average width two and three quarters inches.

35. **Dryobates pubescens medianus** (Swainson). NORTHERN DOWNY WOODPECKER.— Common resident. Eggs: May 22 to June 9. This little Woodpecker is certainly more plentiful during the spring, fall and winter than it is in the breeding season, although it is more abundant than the Hairy at all times. I have not yet found it nesting in any of the orchards, the favourite site in this district being the decayed limb of a maple or birch tree in the woods or on the roadside, at almost any height above the ground. The average dimensions of three nesting holes examined are as follows, viz.: entrance hole $1\frac{1}{8}$ inch diameter, extreme depth 8 inches, and width $2\frac{3}{4}$ inches.

36. **Spyrapicus varius varius** (Linnæus). YELLOW-BELLIED SAPSUCKER.— Common summer visitant; April 19 to Oct. 8. Average date of arrival (for four years) April 22; of departure (for four years) Sept. 22. Eggs: May 18 to 20. During the spring and fall migrations this is certainly the most abundant woodpecker of all, and in the breeding season is not far behind the Flicker for first place. Like the latter bird it often nests year after year in the same tree (but not necessarily in the same hole) the favourite ones here being elm, poplar and butternut. In April it is particularly fond of drumming on the buckets hung on the maple trees to catch the sap. Of two nests examined the average dimensions are as follows, viz.: entrance hole $1\frac{3}{8}$ inches in diameter, extreme depth $10\frac{3}{4}$ inches, and width $2\frac{7}{8}$ inches.

37. **Phlœotomus pileatus abieticola** (Bangs). NORTHERN PILEATED WOODPECKER.— Fairly common resident. This large and handsome Woodpecker is by no means very plentiful, and covering a large area of ground in its daily round in search of food it is more or less by accident that one comes across it. During the breeding season it frequents the larger and deeper woods and as yet I have not been able to locate a nest. From my notes I find thirty-four have been observed in the past five years, and on one occasion a party of five were together, a sight not easily forgotten. Of the above number, fourteen, or nearly one half, were observed during the months of March, April and May, the balance occurring in the fall and winter.

38. **Colaptes auratus luteus** (Bangs). NORTHERN FLICKER.— Common summer visitant; April 19 to Oct. 12. Average date of arrival (for five years) April 21; of departure (for four years) Sept. 28. Eggs: May 18

to June 2. Decidedly the most common of all the woodpeckers nesting year after year in the same tree (generally a birch or maple) but not always occupying the previous year's hole, which as a rule does not exceed fifteen feet above the ground. The average dimensions of five nests examined are as follows, viz.: entrance hole $2\frac{3}{8}$ inches in diameter, extreme depth $17\frac{1}{2}$ inches, and width $5\frac{1}{2}$ inches. The number of eggs in a set varies a good deal, six about here appearing to be the most usual, although on one occasion I found as many as eleven.

39. **Chordeiles virginianus virginianus** (Gmelin). NIGHTHAWK.— Rare transient; Sept. 1 to 2. I have only seen eight examples of this bird, four on the evening of Sept. 2 of last year, and the same number curiously enough on the evening of Sept. 1 of the present year, 1915. On both occasions the evenings were very sultry and the birds were hawking over the marsh, at intervals emitting their loud nasal " peents."

40. **Chætura pelagica** (Linnæus). CHIMNEY SWIFT.— Common summer visitant; May 13 to Sept. 7. Average date of arrival (for four years) May 15; of departure (for two years) Sept. 1. Eggs: June 15. A pair of Chimney Swifts have nested for several years in the chimney stack of my landlord, which during the summer months is not used. I have also found their nest attached to the inside of the perpendicular boards at the gable end of a hay barn.

41. **Archilochus colubris** (Linnæus). RUBY-THROATED HUMMINGBIRD.— Fairly common summer visitant; May 23 to Sept. 21. Average date of arrival (for four years) May 26; of departure (for four years) Sept. 14. At the flowers of a row of scarlet runners or the trunk of a certain birch tree (well pierced with sapsucker holes) I am always sure of finding one if not a pair of hummingbirds. It is a curious medley that gathers at the latter place, butterflies, moths, beetles, flies, Yellow-bellied Sapsuckers and Hummingbirds are all to be found at this one particular tree regaling themselves on the sap that has gathered in the little holes. I have often watched the birds on hovering wings extracting the nectar or flies from the scarlet flowers of the beans, and then perch on some adjacent runner, where resting they would insert their bills into the nearest flowers and go on feeding. This is another of the few summer visitants whose nest I have so far failed to discover notwithstanding persistent searching.

42. **Tyrannus tyrannus** (Linnæus). KINGBIRD.— Common summer visitant; May 3 to Aug. 25. Average date of arrival (for five years) May 8; of departure (for three years) Aug. 22. Eggs: June 3 to July 15. Probably every orchard has its Kingbirds, a pair having nested in one near my house for four consecutive years if not longer, repairing the nest each year. In 1912 they were robbed of two sets of eggs and in desperation forsook the apple tree and took possession of an old Baltimore Oriole's nest in the top of a maple tree in front of my house, in which strange home they laid a third set of eggs and brought up a brood. The following year they repaired the old nest in the apple tree again, thus showing what a strong attachment these birds have for a nesting site once selected. The pair of birds that so

mobbed the young Red-shouldered Hawk had their nest on the top of a small stump in the center of the drowned land, and another curious situation selected by a pair of birds was right on the top of a small bush in the centre of a field. About here three and four, more generally three, seem to be the usual number of eggs in a set; five I have never found and only once a set of two. They are fond of hawking over the marsh and I have seen them strike the water like a swallow on one or two occasions.

43. **Myiarchus crinitus** (Linnæus). CRESTED FLYCATCHER.— Fairly common summer visitant; May 10 to Sept. 9. Average date of arrival (for two years) May 12; of departure (for two years) Sept. 5. Eggs: June 25 to July 10. Previous to the spring of 1914, I had not observed this handsome flycatcher, but am glad to say that since then it has been fairly plentiful, although I have only been able to locate two nests, the one on the above date in July containing the remarkable small set of two eggs only. The nest was in an old woodpecker's hole and when found the female was on the nest, the eggs being somewhat well incubated. In addition to the usual materials this nest contained a large quantity of human hair combings, but no trace of snake skins could be found, which remark also applies to the other nest, which contained a set of five eggs, and was placed also in an old woodpecker's hole twelve feet up in a birch tree in the centre of a field.

44. **Sayornis phœbe** (Latham). PHŒBE.— Common summer visitant; April 13 to Oct. 13. Average date of arrival (for five years) April 14; of departure (for four years) Sept. 28. Eggs: May 14 to June 26. Bridges not being very plentiful in this part of the country, the Phœbe has to content itself with the beams of outbuildings and ledges of verandas for nesting sites, and in the woods the sugar houses are made use of. At one farm house I counted over eight nests in close proximity to one another. This year (1915) a pair built on my veranda and a set of eggs was laid by May 14. These I took at nightfall and substituted three addled Bluebird's eggs with a view of seeing what the Phœbe would do when they failed to hatch out at the proper time. On these substitutes she sat steadily for the first fortnight, then began to leave the nest at intervals, but it was not until after June 16 that I noted a change, when both birds appeared to be taking building material again to the nest. Naturally I became very much interested but not wishing to disturb them, did not inspect the nest again until the 26th, when I found what perhaps has never before been described of this species, viz.: that it had raised the outside of the nest and had built over the offending bluebird's eggs, thus forming a two storied nest similar to a Yellow Warbler when she builds over a Cowbird's egg. At the date mentioned the Phœbe had laid a fresh set of four eggs, which hatched out on July 12, and the young birds left the nest on or about the 29th. I have two sets in which spotted eggs occur.

45. **Myiochanes virens** (Linnæus). WOOD PEWEE.— Fairly common summer visitant; May 25 to Sept. 16. Average date of arrival (for four years) May 29; of departure (for three years) Sept. 8.— This is one of the few summer visitants whose nest I have not yet succeeded in finding, but

this perhaps is not so surprising when one considers how well it harmonizes with its natural surroundings, and that the bird is by no means plentiful here, and seems to confine itself to the woods in preference to orchards and roadsides like the Kingbird and Least Flycatcher.

46. **Empidonax trailli alnorum** (Brewster). ALDER FLYCATCHER.— Common summer visitant; May 16 to Aug. 19. Average date of arrival (for four years) May 21; of departure (for three years) Aug. 17. Eggs: June 8 to July 17. It is only by nest hunting that one can gain any idea of the abundance or otherwise of this species, as the bird is most secretive and one rarely gets a good view of it in the open. It is fairly common here and I have had no difficulty in locating some five or six nests each season. A full set of eggs consists quite as often of three as four, but on one occasion I came across one of two only. In this case I had the nest under observation from the first day it was started and only took the eggs after incubation had been in progress some few days. Dr. Coues is the only author that I have noticed so far who mentions the fact of this bird sometimes laying two eggs in a set only.

47. **Empidonax minimus** (W. M. & S. F. Baird). LEAST FLYCATCHER.— Common summer visitant; May 9 to Aug. 20. Average date of arrival (for four years) May 13; of departure (for three years) Aug. 17. Eggs: June 1 to July 19. Most orchards contain their pair of "Chebecs," and one adjoining my house has been the home of a pair for the past four years. Only on one occasion have I found the birds nesting in the woods, and then it was a small one, and not far from a house. The late date of July 19 is for a second set of eggs, the first having been destroyed. In this case the bird built her second nest not only in the same tree, but in the very same fork as the first one had been placed in, surely a most unusual occurrence.

48. **Otocoris alpestris praticola** (Henshaw). PRAIRIE HORNED LARK.— Fairly common summer visitant; March 7 to June 22. Average date of arrival (for four years) March 15. Eggs: April 14 to 23. It was not until April of the present year (1915) that I discovered this interesting species breeding here, four nests being located during the month. So many new facts were noticed with regard to its nesting habits that I have written a special article (which will appear in this Journal) dealing fully with the subject, and showing a nest with "paving", a trait which hitherto I believe has only been noted with regard to the Desert Horned species. Contrary to the generally accepted idea that it never perches in trees, I have seen it do so on many occasions, but this has been dealt with also in the aforesaid article. Of the four nests located all were warmly lined with the flower heads and plant down of the pearly everlasting (*Anaphalis margaritacea*) a plant which is most abundant here. Three contained a set of four eggs each and the remaining one three young birds, this latter nest being in a very damp situation, and the paving consisting of very small flat stones instead of cow-chips as in the others, which were all in dry situations.

49. **Pica pica hudsonia** (Sabine). MAGPIE.— Very rare accidental transient; Oct. 17. Well acquainted with the Magpie in England I was pleased to make its unexpected acquaintance again on the above date of the present year (1915), when a pair passed in front of me and flew right across the marsh, thus giving me a long uninterrupted view of them. In an interesting letter received from Mr. Taverner he says "I understand that many years ago some European Magpies were liberated at Levis opposite Quebec, and I have always surmised that these scattered records (of which we have a fair number in this end of the Dominion well supported by everything but specimens) are the progeny of these birds." Unfortunately the above date was a Sunday and consequently I had no gun with me as usual, otherwise I should certainly have shot an example, which might have solved this most interesting question, although the European bird is hardly to be distinguished from the American subspecies.

50. **Cyanocitta cristata cristata** (Linnæus). BLUE JAY.— Common. resident; rare in summer, common in spring and fall, less so in winters Eggs: May 24. Evidently the Blue Jay betakes itself to very secluded spots during the breeding season, as I have only succeeded so far in finding one nest, in May of the present year (1915), and had never seen the bird before during the months of June, July and August. It is most abundant in the spring and fall, becoming scarcer during the winter months. The above nest was placed thirteen feet up in a small fir tree on the borders of a swampy wood, and consisted outwardly of twigs and rootlets, lined with fine black rootlets only, and contained four eggs.

51. **Perisoreus canadensis canadensis** (Linnæus). CANADA JAY.— Rare transient; Oct. 21. There is no doubt about the Canada Jay being a rare bird in this district, the only example I have seen in five years is that of a bird shot on the morning of the above date in the present year (1915), and shown to me in the flesh the same evening.

52. **Corvus brachyrhynchos brachyrhynchos** (Brehm). CROW.— Abundant summer visitant; March 10 to Nov. 15. Average date of arrival (for five years) March 9; of departure (for three years) Nov. 8. Eggs: April 23 to May 14. In this district the favourite nesting site is usually at the top of some thick fir tree, where the nest is well hidden from view. Apparently there is some large roost to the northeast of Hatley, as large flocks of the birds can be seen every evening during the fall wending their way there for the night. I have seen a crow descend on a hen coop, seize a young chick which was outside and fly off with it in its claws.

(To be concluded.)

A NEW SUBSPECIES OF HUDSONIAN CHICKADEE FROM THE LABRADOR PENINSULA.

BY CHARLES W. TOWNSEND, M.D.

Penthestes hudsonicus nigricans, subsp. nov.

Subsp. Char.— Midway in size between *Penthestes hudsonicus hudsonicus* and *P. hudsonicus littoralis*, bill as short as that of *littoralis* and as thick as *hudsonicus*. Darker than either on back and sides and much less brown.

Type. — No. 1420, coll. C. W. T. ♂ ad. Shekatika, head of inlet Saguenay County, Quebec, Canadian Labrador, July 23, 1915; collected by C. W. Townsend.[1]

Range.— So far as known, forested region of Labrador Peninsula.

Description of adult. Sexes alike. Crown, nape and back mouse-gray slightly tinged with hair brown; wings and tail dull slate-color; throat black, ear coverts, sides of neck, breast and belly white; sides brownish drab.

Measurements ♂ (type) wing 66, tail 64, tarsus 15, bill, culmen, 8.5, depth at base 4.5.

♀ wing 62, tail 62, tarsus 14, bill, culmen, 8, depth at base 5.

Remarks. The short, stout bill and dark back almost devoid of brown tint as well as the absence of a strong brown tint on the sides make this a well marked subspecies. In its dark sooty tendency it resembles other birds of the forested regions of the Labrador Peninsula such as the Labrador Horned Owl and the Labrador Jay. This region abounds in water in the bogs, lakes and rivers and its climate in summer is humid. A number of other birds of this region appear to have a tendency to darkness in plumage, *e. g.* Red-tailed Hawk, Flicker, Night Hawk and Water-Thrush.

It is probable that the Hudsonian Chickadees of the treeless or scrub Arctic and Subarctic area in Ungava Labrador and Newfoundland Labrador are *P. hudsonicus hudsonicus*. Specimens from Lance au Loup taken in May belong to this latter form. The Ungava form described by Rhoads in 1893 (Auk, X, 1893, p. 328) has the brown coloration of *hudsonicus*. I am greatly indebted to Mr. Outram Bangs for his assistance in preparing this note.

[1] I have since given the type specimen to the Museum of Comparative Zoölogy at Cambridge, Mass., and it now bears the number 69431.

GENERAL NOTES.

An Accomplishment of the Red-throated Loon.— While on the southern end of Puget Sound in November and December, 1914, and particularly on Oyster Bay, Washington, the writer had opportunity of making observations on the Red-throated Loon (*Gavia stellata*). This small Loon is noticeably handier on the wing than *G. imber*, but differs especially from that species in its ability to get under way from a position in the water. When the waves are rolling it must splatter through the crests of a number of them before it gets clear, but from still water the Red-throated Loon can spring into the air and proceed directly into normal flight, an accomplishment in striking contrast to the limitations tradition ascribes to powers of flight in the Loon kind.— W. L. McAtee, *Washington, D. C.*

The Long-tailed Jaeger in Indiana.— While collecting along the beach east of Millers, Indiana (near Dune Park), Sept. 21, 1915, I shot an adult male Long-tailed Jaeger (*Stercorarius longicaudus*). The bird was on the beach in the vicinity of a small flock of Ring-billed and Herring Gulls. The Gulls arose out of gunshot and flew out over the lake, but the Jaeger circled around inland as if unwilling to leave the locality, and on concealing myself, he soon returned and was secured. This is, I believe, the first record for this species from Indiana, and I have been unable to find any previous records from Lake Michigan. The specimen is in the collection of the Field Museum.— H. L. Stoddard, *N. W. Harris Public School Extension of Field Museum of Natural History, Chicago, Ill.*

Notes on Hybrid Ducks from Long Point, Ontario.— Among a number of ducks recently shot at Long Point, Ontario, was an interesting hybrid between *Anas rubripes* and *A. platyrhynchos*. It was an immature male, and every character which normally distinguishes the two species was about evenly merged in this bird. It was large, weighing three and a quarter pounds, and was the second hybrid of the same parentage to have been taken on these grounds. The first was a more mature bird, taken about 1912 (now mounted at the Long Point Club) showing vermiculation in the plumage, which the younger specimen lacks.

A fine adult male European Widgeon was taken here on October 12, 1914, and is also in the club collection.— Louis Agassiz Fuertes, *Ithaca, N. Y.*

Early European Widgeon on Long Island.— On Sept. 12, 1915, a European Widgeon (*Mareca penelope*) was observed by the writers on Moriches Bay under the beach meadows at Mastic, Long Island, with three American Widgeon (*M. americana*). It was examined carefully through binoculars in sufficiently good light to make out its gray dark-

tipped bill. The head was chestnut, the sides of the breast cinnamon, and as it flew the white in the wing was of course conspicuous. It was probably an eclipse male. This is a very early, so far as we know, the earliest recorded date for this rare duck. Strangely enough on Sept. 12, 1914, at almost exactly the same spot, a reddish headed bird was observed by the senior writer among about fifty American Widgeon, which were associated with a large flock of Black Duck. This 1914 bird was, however, not satisfactorily determined.—J. T. Nichols and Ludlow Griscom, *New York City.*

A Record of the Golden Plover (*Charadrius dominicus dominicus*) in the State of Washington.— This interesting species has never before, to my knowledge, been recorded as occurring in the State of Washington. It gives me pleasure, therefore, to announce the capture of an adult female at Dungeness, Clallum County, Washington. This bird was taken on Nov. 14, 1915, by Mr. F. P. McIntyre, of Tacoma, Wash., who very kindly presented it to me and the skin is now in my collection. Mr. McIntyre informs me that he saw about a dozen other plover resembling this one, but that he shot no more. It is possible that these, also, might have been *dominicus*, but the Black-bellied Plover (*Squatarola squatarola*) is a common visitor to Washington, so I think there is an equal possibility that the other birds seen might have belonged to that species.

Since obtaining the above mentioned specimen Mr. D. E. Brown, of Seattle, Wash., told me of a specimen of *C. d. dominicus* that was taken near there several years ago, but which I think was never recorded. Mr. Brown also saw what, owing to the great amount of yellow on the upper parts, he feels positive was another of this species a year or two ago on the Tacoma Flats. This was in the late spring and the bird was in full breeding plumage. Needless to say that Mr. Brown is we'l acquainted with *S. squatarola* in all plumages.

It seems very possible that certain of our shore birds are much more numerous as migrants in Washington than is generally believed. The Knot (*Tringa canutus*), for example, is given in the A. O. U. Check-List as rare on the Pacific coast. It is therefore, interesting to note that on May 11, 1913, Mr. Ray Gamble, of Tacoma, Wash., saw them in hundreds at Willapa Harbor, Wash. Mr. Gamble brought back quite a sufficient number to prove the truth of his report. In the spring of 1914, Mr. D. E. Brown found the Knots to be by no means rare.

Another species that has almost invariably reported as rare "on the Pacific coast south of British Columbia, except in Lower California" is the Pectoral Sandpiper (*Pisobia maculata*). I consider this species to be probably a regular fall migrant in the vicinity of Tacoma, Wash. Some years it is common, twenty or more being seen on a morning walk on the Tacoma Flats.

The same thing may be said of the Yellow-legs (*Totanus flavipes*), which is usually recorded as rare on the Pacific coast of the United States. This

species is at times a common fall visitor, Mr. D. E. Brown seeing a flock of forty-eight on Aug. 16, 1913. The earliest arrival of which I have a record is one that I collected on July 25, 1913.

The study of the *Limicolæ* has been sadly neglected in the State of Washington, partly because of adverse laws. It may be for this reason that literature on the subject is occasionally in error, but it also seems possible to me that the shore birds may have to some extent changed their route of migration.— J. H. Bowles, *Tacoma, Wash.*

Barn Owl in Massachusetts.— On Oct. 21, 1915, a fine full plumaged male Barn Owl (*Aluco pratincola*) was taken in a trap on my place at Wenham, Mass.— John C. Phillips, *Wenham, Mass.*

Display of the Purple Finch.— On May 20, while at the path between the Flume House and the Flume, Crawford Notch, White Mts., N. H., I watched an interesting display of a male Purple Finch. There were two pairs of these birds. Close by me were two males and a female feeding on the ground, and perhaps twenty-five yards away a single female, also hopping about on the ground. Very suddenly one of the males jumped up and after a short rapid flight lit about six inches from the lone female, and stood bolt upright, and facing her with extended wings. He then began to vibrate his wings rapidly, but kept them extended all the while. The motion was so fast that the wings were blurred to the eye. I have seen a cock silver pheasant display in a somewhat similar way, sitting on a perch, only the vibration of the wings did not extend over so wide an arc.

The male finch kept this up for ten seconds, with perhaps only one or two brief intervals of arrested motion. Then the second male bird charged him and put him to flight. Evidently it was a case of trespass.— John C. Phillips, *Wenham, Mass.*

Late Nesting of the Montana Junco.— On Sept. 1, 1912, while working on the western slope of the Teton Mountains of western Wyoming, I found the nest of a Junco, apparently belonging to the above species. The nest was on the ground among flowers and grass in a straggling grove of spruce trees and at an elevation of 9700 feet above sea. It contained four newly hatched young birds. As this level is only 200 feet below the average elevation of timber-line for the range, winter sets in much earlier than in the valleys of the same region. In that particular year a soft snow fell on the night of September 1 to a depth of over three inches, and at the end of twenty-four hours some of it was still left. Another snowstorm followed about five days later. I did not see the nest after the snow, but under such unfavorable circumstances it seems unlikely that the pair of Juncos was able to rear its brood to maturity. No doubt this was a case of abnormally late nesting, probably to be explained by some accident that prevented the birds from rearing broods that they may have had earlier in the summer.— Eliot Blackwelder, *Madison, Wis.*

Philadelphia Vireo (*Vireosylva philadelphia*) **in Massachusetts in Autumn.**— On Sept. 5, 1915, I shot a young male Philadelphia Vireo in Harvard, Mass. The specimen is now in my collection (No. 551).

I am indebted to Mr. Outram Bangs of the Museum of Comparative Zoölogy for verifying my identification.— JAMES L. PETERS, *Harvard, Mass.*

Additional Autumn Records for the Tennessee Warbler (*Vermivora peregrina*) **in Massachusetts.**— I have previously had occasion to record (Auk, Vol. XXXI, No. 1, p. 103), the occurrence of the Tennessee Warbler in Harvard, Mass., during the autumn migration. I now wish to add the following additional instances of its occurrence in this town since my last note was published.

Sept. 25, 1913, a young male shot (coll. J. L. P. No. 415).
Sept. 11, 1915, an adult male shot (coll. J. L. P. No. 565).
Sept. 23, 1915, an adult male shot (coll. J. L. P. No. 595).
Sept. 30, 1915, one seen.

The lack of records for 1914 is accounted for by the fact that I was out of the State throughout the autumn. I have no doubt that the species occurs sparingly with us every autumn.— JAMES L. PETERS, *Harvard, Mass.*

Orange-crowned Warbler (*Vermivora celata celata*) **in North Carolina.** — On Jan. 3, 1915, we discovered an Orange-crowned Warbler in some live oaks on Monkey Island, Currituck Sound. The bird was collected and proved to be a female. It is now in the collection of the American Museum of Natural History, catalogue No. 123,791.

Mr. T. Gilbert Pearson informs us that this is the third record for the State. The species is rare in winter as far north as Charleston, S. C.— J. T. NICHOLS AND LUDLOW GRISCOM, *New York City.*

Blue-gray Gnatcatcher at Groton, Mass.— On Nov. 19, 1915, a female or immature Blue-gray Gnatcatcher (*Polioptila c. cærulea*) was found dead on Hollis St., in Groton, Mass., by Master Robert F. Cressey, seven years of age, a member of the local bird club. The specimen is now being mounted for the collection of the Museum Society at Groton School.— WILLIAM P. WHARTON, *Groton, Mass.*

Notation of Bird Songs and Notes.— I think the importance of this difficult subject justifies patient and kindly effort long continued in suggesting methods and improvements until we approach perfection as nearly as practicable.

The common five-line music staff is good for pitch and rhythm; but it seems to me unnecessary to indicate the exact pitch of bird notes since they vary to a great extent. Besides, the notes and songs of a number of individuals of a given species differ so much that a music-staff notation of one or two birds of most species would present but a small portion of the re-

pertoire of the whole species. We might give, for instance, staff representations of twenty, or even fifty in some cases, of different Song Sparrows, and yet these would match but few of the next twenty or fifty. Most songbirds, too, have different songs and notes in autumn, mostly altered fragments of their regular spring songs. And yet again, birds of the same species vary in different parts of the country. For examples: The Ovenbird in New York says *teacher, teacher, teacher*, while in the Potomac region he never says anything like it, but instead, *tsit, tsit, tsit*, loud and sharp. The Towhee in the vicinity of Washington, D. C., sings — tr/l-l-l-l-l, the higher part with a charming metallic trill, while in the middle west his song is — tr/te-te-te-te-te, neither metallic nor trilled. The eastern Meadowlark in western Illinois in spring scarcely ever sings his characteristic tinwhistle song, but generally, while perched upon a fence-post, utters his ground buzzing, castanet rattle with up-and-down variations, prolonged to the full length of a Song Sparrow's performance in May.

Practically I often identify a bird more by the quality of style, or both, of its utterance than by the number and succession of its notes; and these, the quality and style, can only with difficulty be denoted on the five-line staff. These characteristics are generally described at length in the accompanying text. Perhaps this is the best that can be done. Of course, a system of symbols can easily be devised to be written under each note in the staff, but they would be so numerous that the learner would have to practice upon them a long time in order to be able to read them rapidly.

In my own field practice I use the system already illustrated above, with about twenty symbols underneath to indicate *timbre*, tin-whistle or fife tone, chip, chirp, chatter, trill, warble, squeal, squall, aspirated or wheezy character, etc.

The greatest difficulty imitators encounter in representing upon paper the songs and notes of birds is the fact that surprisingly few persons — only one in a hundred or a thousand, perhaps — could understand fully even the most perfect system of notation that could be devised. Phoneticians, even those of the highest order, such as are employed in the compilation of our standard dictionaries and schoolbooks, often fail to understand one another clearly; and but few people, one in a hundred or more, perhaps, are musicians far enough advanced to be able to perceive clearly what would be meant by some of the characters that would have to be employed, even when explained at length.

An elocutionist and phonetician in Chicago once showed me a very elaborate chart which he had compiled of all the phonic elements in the English language, that he was about to publish as " the greatest thing out." My glance at it was so short that I read but one item, and that was, that long *a* as in *fate* was diphthongal. I asked him whether *a* was diphthongal or a compound in the word *chaos*. That threw him into a spasm of cogitation, from which he had not recovered when I last heard from him! Some people imagine they pronounce the *r* in *harder* when in fact they say *hodda*. In listening to some Englishmen we vaguely think they pronounce the

words *more, door, you, your, yours*, etc., about right when in fact they say *maw, daw, yaw, yaw, yaws*, etc.

This most discouraging fact prevents us all from making any attempt at the compilation of a text-book of bird songs for popular use; and there are not phoneticians, musicians and elocutionists enough among bird students to justify the publication of a work of that kind.

Therefore, so far as I can see now, the best way for all bird students to learn bird songs, besides identifying the birds themselves, is to visit the wilds in company with experts. This, of course, "knocks out" the idea of notation, except so far as one may devise a scheme for his own private use.— EWING SUMMERS, *Washington, D. C.*

The Type Locality of *Brachyramphus craverii*.— The Island of Natividad, off the west coast of Lower California, has been considered as the type locality of *Brachyramphus craverii*. The species was originally described by Salvadori as coming from this island, and in his original description he refers to the account that Craveri has left of his visit to the Island in 1865. He speaks of it as a low island where were groups of Cormorants looking in the distance like platoons of soldiers. He says that the soil of this island was sandy, and that all of the island not occupied by the Cormorants was excavated by the Murrelets for their nests.

Anthony visited this island of Natividad in 1900, and found the Cormorants there, as described by Craveri, and found the ground honeycombed, but these burrows all belonged to the Black-vented Shearwater (*Puffinus opisthomelas*), but not a single Murrelet of any species was found on the Island, nor has any one ever found *Brachyramphus craverii* anywhere along the western coast of Lower California.

Craveri gives the latitude as 27° 50′ 12″ N., which is not at all the latitude of Natividad Island, but is exactly the latitude of Isla Raza in the Gulf of California, and it seems probable that this latter island is really the place from which the type specimen of *Brachyramphus craverii* was obtained.

Craveri was seeking for guano, and Isla Raza is a guano island, while Natividad Island does not furnish any of this product. Salvadori speaks particularly of Craveri having found the Murrelet nesting under the rocks, which is exactly what *Brachyramphus craverii* does at the present time on Isla Raza. Salvadori speaks twice of the type specimen of his bird as having come from the Gulf of California.

From the above facts it seems probably that there has been a mistake in the type locality of *Brachyramphus craverii*. It is probable that Craveri visited both Natividad Island and Isla Raza, and that Salvadori has made a mistake as to which of these islands was the one on which Craveri obtained the type of his Murrelet, and that Isla Raza is the real type locality of *Brachyramphus craverii*.— WELLS W. COOKE, *Biological Survey, Washington, D. C.*

Eye Shine in Birds.— In a recent interesting and valuable article on "Nature's Transformations at Panama" (National Geographic Magazine, August, 1915, p. 176) Shiras called attention to, and gives his observations in studying, the glow seen at night in the eyes of various animals when they are facing a bright light.

The present writer is pleased to contribute to the literature of this subject an observation of his own. Not long ago, while motoring at night through a particularly dark canyon, I noticed far ahead in the illuminated road, two small glowing pink spots, which were extinguished when a bird flew from the road on the near approach of the car. The bird alighted again, some distance ahead in the road, when the pink points reappeared, and were identified as the bird's eyes; it was shot, and proved to be a Nuttall's Poorwill. This observation fits in well with those of Shiras who recorded this eye shine in Nighthawks.

It is well here to interject the question as to whether this glow in birds' eyes does come from a true *tapetum lucidum*, as is implied (or stated) by Shiras, inasmuch as Casey Wood (a highly qualified authority on comparative ophthalmology) says "The tapetum is absent in birds, although the Ostrich has a glass-like layer in the choroid of lamellated structure capable of reflecting light. This arrangement, however, is only a retino-choroidal variation, and not a true tapetum" (Am. Encyclop. Ophthalmology, Vol. IV, p. 2653).

The present writer has no desire to split hairs, but merely wishes to call attention to a point (one amongst hundreds) awaiting decision. It may be that no bird has a true tapetum, or if Caprimulgine birds have not yet been examined for this structure, it is equally possible that birds of this type *do* have a true tapetum; all this reminds one that there is plenty of material still left for original research, or to be used in corroborating or disproving earlier work.— W. H. Bergtold, *Denver, Colo.*

Weight and Contents of Birds' Eggs.— The following data have been collected during the past two years and are here presented as there seems to be but little recorded information on the subject. The eggs were weighed before and soon after blowing (when thoroughly dry). The latter weight of course, represents the weight of the shell and the difference between the two, the weight of the contents. The contents are also given in cubic centimeters. In some cases the actual contents were measured, in others the shell was filled with water and the water measured. With proper instruments it would be possible to determine the specific gravity of the contents of the egg. It would be interesting to learn if this would show any relation between eggs of species of the same family or order.

Only averages are given below for each set or series of eggs.

		Average Weight Full				Empty				Cubic Contents
Loon (4 eggs)		5 oz.	5 dr.	1 scr.	2. gr.	4 dr.	3 scr.	0 gr.		147 c.c.
Common Tern	(set of 3)		5.	0.	17.5	1.		3.2		17.5
	(set of 3)		5.	0.	2.8	1.		3.2		17.3
	(set of 3)		5.	0.	6.1	1.		3.8		17.7
	(set of 3)		5.	0.	2.3	1.		3.5		17.4
Black-crowned	(set of 3)	1.	2.	1.	4.	2.		15.		26.
Night Heron	(set of 3)	1.	1.	2.	0.	2.		9.		24.
	"	1.	2.	1.	6.	2.		9.		25.
	"	1.	1.	1.	19.	2.		9.		24.
Belted Kingfisher	(set of 3)		3.	1.	16.			15.7		12.7
Kingbird	(set of 4)		1.	0.	10.			6.		3.6
Bobolink	(set of 5)			2.	6.7			2.5		2.5
Chipping Sparrow	(set of 4)			1.	5.7			1.3		1.7
	(set of 4)			1.	3.9			1.3		1.4
Song Sparrow	(set of 5)			1.	13.5			3.65		1.8
	(set of 5)			1.	16.5			2.35		2.
	(set of 4)			1.	11.			2.5		1.6
English Sparrow	(set of 4)			2.	1.1			3.6		2.5
	(set of 4)			2.	4.9			4.		2.6
	(set of 5)			1.	15.3			3.6		2.2
	(set of 5)			2.	3.3			3.5		2.2
Barn Swallow	(set of 5)			1.	9.8			1.7		1.6
	(set of 4)			1.	1.9			1.5		1.3
Bank Swallow	(set of 5)			1.	.2			1.		1.04
	(set of 4)				18.7			1.		1.05
	(set of 5)			1.	1.7			1.		1.15
	(set of 6)				18.9			1.		1.02
Tree Swallow	(set of 4)			1.	8.			2.5		1.5
Cliff Swallow	(set of 3)			1.	14.			2.6		1.8
Red-eyed Vireo	(set of 3)			1.	14.7			2.2		2.
	(set of 4)			1.	14.			2.		1.7
Ovenbird	(set of 4)			2.	5.			3.		4.
Yellow Warbler	(set of 4)			1.	2.5			1.25		1.25
	(set of 5)			1.	.9			1.25		1.4
Redstart	(set of 4)			1.	1.8			.98		1.3
	(set of 4)			1.	2.7			1.		1.6
Catbird	(set of 4)			1.	8.8			3.9		3.2
				2.	4.			3.3		3.4
Veery	(set of 4)			2.	6.			3.		2.4
Robin	(set of 4)			1.	7.1			4.8		5.3

—Lt. G. Ralph Meyer, *Fort McKinley, Me.*

RECENT LITERATURE.

Watson and Lashley on Homing and Related Activities of Birds.[1] — In 1907, Dr. J. B. Watson made some investigations on the homing of Noddy and Sooty Terns at Bird Key, Tortugas, Florida, which were published as 'Publication 103' of the Carnegie Institution of Washington and formed probably the most noteworthy contribution to the subject of bird migration that has appeared in recent years. He demonstrated among other things that two incubating Sooty Terns taken from their nests on Bird Key and liberated off Cape Hatteras returned to their nests in five days covering a distance (by water) of approximately 1081 statute miles, most of it over areas where Sooty Terns do not normally occur and where these birds had had no previous experience.

The present publication describes the continuation of this investigation, carried on during 1910, 1912 and 1913. In order to meet a possible explanation of the Hatteras flight on the ground that the birds followed the coast line southward, experiments were made by liberating birds at Galveston and at various intermediate stations in the open waters of the Gulf of Mexico. From all of these trials birds returned safely to their nests. This disposed entirely of the coasting theory. A further suggestion has however been offered that the birds followed a well-marked water-current which sweeps across the gulf from Texas to Tortugas and which differs in color from the surrounding water. This is also disposed of by the fact that a number of the returning birds were liberated at night and passed through rain, haze and cloudy weather when the difference in the water would not be noticeable — if indeed it is at any time, from the position of the flying birds.

Therefore as Dr. Watson says the fact has now been established that *Noddy and Sooty Terns can return from distances up to* 1000 *miles in the absence of all landmarks.* This materially simplifies the problem of homing and what we now need is experimental work of a definite kind to determine the sensory mechanism by means of which the birds accomplish their return flights.

This present paper contains valuable preliminary contributions along these lines. Mr. Lashley gives an account of his studies of the nesting activities of the terns in which he proves that orientation in the neighborhood of the nesting place — *i. e.* return to nest, or young, or mate — is based largely upon visual habits, placing these activities in a different category from distant orientation.

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[1] Homing amd Related Activities of Birds. By J. B. Watson and K. S. Lashley. The Acquisition of Skill in Archery. By K. S. Lashley. Papers from the Department of Marine Biology of the Carnegie Institute of Washington. Alfred G. Mayer, Director. Volume VII. Publication No. 211. [Distributed July, 1915.] pp. 1–128.

Further proof against the ability of the birds' sight being sensitive to objects far distant is given in the mathematical fact that the curvature of the earth would necessitate a bird ascending nearly a mile in the air to reach rays from a lighthouse 150 feet high and 100 miles distant, granting the absence of haze which is almost always present.

It has moreover, been proven that vision in the chick is much less acute than in man and Dr. Watson shows that neither the chick nor the pigeon are sensitive to infra-luminous rays.

In the terns he also proves that there is no special tactual or olfactory mechanism in the nasal cavity which could aid homing. The facts presented are admittedly negative but Dr. Watson says, "the task of explaining distant orientation is an experimental one, which must yield positive results as soon as proper methods are at hand." While the difficulty of explaining it by current theories is admittedly great he does not suggest "the assumption of some new and mysterious sense."

He suggests work on the sensory equipment of homing pigeons saying that "it is just possible that these animals possess on certain parts of the body (eyelids, ear covering, oral cavity, etc.), sensitive tactual and thermal mechanisms which may assist them in reacting to slight differences in pressure, temperature, and humidity of air columns."

This contribution contains also a review of the various theories that have been advanced to explain homing, as well as a wealth of detailed investigation that cannot be dealt with here. Much reliable information with regard to homing pigeons and their flights gathered from practical fliers is likewise presented — data which have been in much demand. Ornithologists would do well to read the paper in its entirety as it is a good example of the methods of the student of behavior in eliminating complicating factors and avoiding the unwarranted conclusions into which the untrained investigator rushes blindly. While the 'mystery of mysteries' still remains unsolved, Dr. Watson has made great advances in showing us what factors are *not* involved in its explanation, and in disposing of a host of theories which tended only to obscure the problem, thus leaving it clearly defined for future investigators.— W. S.

Thorburn's 'British Birds.' [1] — It might be supposed that there was not room for another work on a subject that has received as much attention as the birds of Great Britain; but anyone who examines Mr. Thorburn's work, even casually, will we think concede that he has proved the error of this assumption.

With the wealth of data which is available any competent writer may

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[1] **British Birds | written and illustrated by | A. Thorburn, F. Z. S. | with eighty plates in colour, showing over | four hundred species | In four volumes | Vol. 1 | Longmans, Green and Co. | 39 Paternoster Row, London | Fourth Avenue & 30th Street, New York | Bombay, Calcutta, and Madras | 1915. Large 4°. pp. i–viii + 1–143, pls. 1–20. $40 for the set of four volumes, or payable on delivery at $10 each. No volumes sold separately.**

compile a good history of the birds of the British Isles, many are also able to write entertainingly of their habits, while others can produce creditable pictures of the various species.

No matter how many works may have been produced along these lines, however, there is always room for such a series of portraits as Mr. Thorburn has given us. Only an artist of great talent and one thoroughly acquainted with his subjects could paint such bird pictures as these.

We are told in the preface that the majority of the figures are based upon life studies which the artist has been making for many years past, but it is not the beauty and accuracy of the individual figures alone that attract us. While it was necessary, as in most such works, to represent a number of species on each plate, the figures in Mr. Thorburn's plates are strikingly in harmony; a judicious arrangement of the several backgrounds, and the introduction of a spray of blossoms to emphasize a desired contrast make each plate a work of art in itself, not simply a collection of several small paintings on one page. And yet where birds of quite different habits are represented on one plate the characteristic surroundings of each are well maintained. It is we think this note of harmony in almost every plate, and the masterly handling of the backgrounds which emphasize the beauty of the bird portraits and give the charm to these paintings of Mr. Thorburn.

The plates are printed on cardboard with a neutral gray background which brings out the white portions of the birds' plumage with striking brilliancy. Both of these features help to make the plates unique among bird illustrations.

We have spoken only of the plates and indeed the author says that his first intention was that the book should be "simply a sketch book of British Birds." He was later induced, however, to add a short letterpress with descriptions of the species and notes on their distribution, nests, eggs, food, songs, etc. While this is admittedly largely a compilation from the leading authorities on British birds it is a very satisfactory accompaniment to the beautiful plates, presenting clearly and concisely the facts that the general reader will desire. The publishers have done their part well, the printing of the "three-color half-tone" plates being remarkably well done.

Mr. Thorburn's work will appeal to a host of people beyond the ranks of the ornithologists or even of nature students in general, for plates such as he has produced attract the attention and admiration of lovers both of art and of beautiful books.

Volume I covers all of the Passerine species except the Larks and part of the Corvidæ, Volume II [1] treats of these as well as the Picarian families, Birds of Prey, Steganopodes and Herons. The work will be completed in four volumes, the remaining two being promised in the spring and autumn of 1916.— W. S.

[1] pp. 1–72, pl. 21–40.

Grinnell's Distributional List of the Birds of California.[1] — This is Dr. Grinnell's third list of California birds, the first appearing as ' Pacific Coast Avifauna No. 3,' in 1902; and the second, a mere nominal list of species, as 'Avifauna No. 8,' in 1912. These contained respectively 491 and 530 species and subspecies while the present list totals 541.

The plan of this work is practically that of the 1902 list with the addition of many definite records and references covering the extremes of range or other critical occurrences. In the case of rare species references to all the records are given.

As the list is solely distributional in character no data regarding migration, extent of breeding season, etc., are included. Synonyms used in works on California birds are given as in the earlier list and these are included in the index so that any of the old records may readily be referred to the currently recognized form. The three maps are a valuable aid in understanding the details of distribution given under each species and subspecies and a chapter on ' Distributional Areas ' gives Dr. Grinnell's latest views on a subject upon which he is the recognized authority.

The classification is that of the A. O. U. Check-List, which was also followed in the 1902 list, but not in that of 1912, the author agreeing with the A. O. U. Committee that the benefits of uniformity in sequence with the great bulk of American ornithological literature outweighed the advantages of being more ' up to date ' with a classification which itself is admittedly only temporary. Sequence of species and subspecies and nomenclature are nearly those of the A. O. U. Check-List differing in the rank accorded certain forms and in the relationship of subspecies. Species and subspecies are printed in the same type and numbered consecutively with no binomial headings for groups of subspecies and no headings for generic or higher groups, as the list, being distributional, only does not concern itself with details of classification or nomenclature.

Some forty races not admitted or not yet considered by the A. O. U. Committee are recognized by Dr. Grinnell while *Melospiza melodia morphna*, *Aphelocoma californica obscura* and *Falco sparverius phalæna* which appear in the A. O. U. Check-List are rejected.

We notice that the recognition of extralimital races in the case of several groups leads to the doubling of the specific name as *Ochthodromas wilsonianus wilsonianus* but this is not done in the case of *Passer domesticus* where several extralimital races are generally admitted. The A. O. U. Committee committed this same error (cf. Auk, 1913, p.) and doubtless Dr. Grinnell followed their example as he apparently did in writing '*Actitis macularius* '

[1] A Distributional List of the Birds of California. By Joseph Grinnell. Contribution from the Museum of Vertebrate Zoölogy of the University of California. Cooper Ornithological Club. Pacific Coast Avifauna. Number 11. Hollywood, California. Published by the Club, October 21, 1915. pp. 1–217, pl. I–III [maps].

erroneously so published in the 'Pocket Edition' of the Check-List, although it appears correctly '*macularia*' in the regular edition.

Dr. Grinnell's work closes with a 'Hypothetical List' of 61 species erroneously accredited to California or recorded upon evidence which he is unable to accept as conclusive.

Altogether this list is admirably prepared and gives us the status of the Californian avifauna up to date by one whose opinion upon this subject is accepted as authoritative, although there may be differences of opinion as to the number of geographic races that it is desirable to recognize even in so diversified a State as California.

There may be expressions of regret at the absence of data on migration, nidification and taxonomy, but the author has explained in the introduction that the list is solely distributional and he has consistently adhered to his plan.— W. S.

Wood on the Eyelids of Birds.[1] — Dr. Wood here presents the results of investigations made in conjunction with Prof. Slonaker in the physiological laboratories of Stanford University, largely upon the eye of the English Sparrow, although various other species were also examined. He considers in great detail the muscular structure of the eyelids and the method of lachrymal drainage. Not only is the activity of the lids reversed from what we find in the mammals, the lower not the upper one being movable, but the whole method of closing is different. The Ostrich, Seriema and certain birds of prey have filoplumous feathers which serve the purpose of eyelashes in mammals and closely resemble them. The Sparrow's eyelashes, however, do not apparently offer any protection to the eye while the Parrots have no trace of eyelashes.

Dr. Wood's paper is a careful piece of technical work, and similar studies in the anatomy of other avian organs would be welcome.[2]

The confusion that may arise when the technicalities of two branches of science are brought together is curiously illustrated in Dr. Wood's treatise. He constantly makes use of the word 'tarsus' familiar to ophthalmologists as indicating a plate of condensed connective tissue on the edge of the eyelid, but when he addresses ornithologists who know the tarsus only as the usually exposed portion of the bird's foot above the toes, this term is somewhat confusing!— W. S.

Cooke on the Distribution and Migration of North American Gulls.[3] — In this pamphlet Prof. Cooke treats the Laridæ in the same

[1] The Eyelids and Lachrymal Apparatus of Birds (reprinted from Ophthalmology, July, 1915). By Casey A. Wood, M. D. Repaged 1–18.

[2] cf. p. 84, *antea*.

[3] Distribution and Migration of North American Gulls and their Allies. By Wells W. Cooke. Bull. No. 292, U. S. Dept. of Agriculture. October 25, 1915. pp. 1–70. (For sale by Supt. of Documents Gov't. Printing Office, Washington, D. C. 15 cents.)

way that the Anatidæ, the Shorebirds, the Rails and the Herons have received attention in previous bulletins of the Department of Agriculture.

A brief introduction treats of the economic importance of Gulls and measures that have been taken for their protection. Then follows a detailed account of the summer and winter range and dates of migration for each of the 30 species and subspecies of Gulls, Skuas and Jaegers, found in North America, with the name of the authority for each record. A map showing the summer and winter range of each species is given with several figures of the more common Gulls.

Incidentally we note that *Larus nelsoni* remains one of the rarest of birds, only four specimens having been taken, three on the coast of Alaska and one at San Geronimo Island, Lower California. There has been no record of the species whatever since the specimen obtained by E. A. McIlhenny at Point Barrow, Alaska, on Sept. 5, 1897, which is now in the collection of the Philadelphia Academy.

Prof. Cooke's publication is a welcome summary of our knowledge of the distribution of the North American Laridæ and will prove a valuable work of reference.

The title may be regarded as a little unfortunate as the Terns are much closer allies of the Gulls than are the Skuas and Jaegers which belong to another family. Limitation in the size of the 'Bulletins' no doubt prevented the inclusion of the Terns, but this fact might have been mentioned and the close relationship of the two groups emphasized.— W. S.

Gaige's 'The Birds of Dickinson County, Michigan.' [1] — This list is based upon observations made from June 30 to August 24. The region is divided into several distinct habitats and the 88 species listed are considered with regard to their distribution in these habitats, with notes on migration, food, nesting, habits, etc. An interesting feature of the paper is the consideration of the effect of a severe forest fire upon the distribution of the various species. It undoubtedly drove out many forest loving species from the area which it covered, but opened up a new breeding area to Woodpeckers, Tree Swallows, Chimney Swifts and Bluebirds, while Vesper Sparrows and Goldfinches were drawn there to feed upon the seeds of weeds and thistles which covered the burned areas, and Sparrow Hawks to devour the grasshoppers which appeared in abundance. Even migrant Shorebirds were attracted by the cedar and tamarack swamps which the fire had converted into open shallow pools.

The paper contains much of interest and value, although it cannot be expected to cover nearly all the birds of the county. The title on this account is perhaps a little misleading.— W. S.

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[1] The Birds of Dickinson County, Michigan. By Frederick M. Gaige. Reprinted from Sixteenth Report Michigan Academy of Science, pp. 74–91.

Mearns on New African Birds.[1] — In this, his thirteenth paper on new African birds, Dr. Mearns first considers the subspecies of *Turacus hartlaubi* of which he recognizes four, *T. h. medius* (p. 3) Mt. Kenia, *T. h. crissalis* (p. 3), Mt. Mbololo and *T. h. cærulescens* (p. 4), Mt. Gargues, being described as new. He also describes the following new forms, *Corythæola cristata yalensis* (p. 5), Yala River; *Cursorius gallicus meruensis* (p. 5), Meru River; *C. temminckii jebelensis* (p. 6), Lado Enclave; *Rhinoptilus africanus raffertyi* (p. 7), Iron Bridge, Hawash River, Abyssinia, and *Sarothrura loringi* (p. 8), Mt. Kenia.— W. S.

Beal on the Food Habits of Thrushes.[2] — This report is supplementary to Bulletin No. 171, which treated of the Robin and Bluebirds, and is devoted to Townsend's Solitaire and the speckled breasted thrushes of the genus *Hylocichla*. Increased material and further investigation have led to much more detailed analyses of the food of these birds than those which have appeared in other publications of the Biological Survey, but the general conclusions remain the same. The thrushes are largely insectivorous, while the vegetable portion of their food (40.72 per cent) consists mainly of wild berries, their destruction of domestic fruits being negligible.— W. S.

Miller on Three New Genera of Birds.[3] — Mr. Miller is doing excellent work in carefully examining the structural characters of various birds with regard to their generic position, as many species when first described were hastily referred to genera to which they have no close affinity and a certain number have never been removed. A case in point is the large owl *Bubo blakistoni* Seebohm and its ally *B. dærriesi*. These Mr. Miller finds are not referable to Bubo at all being evidently northern representatives of the Fish Owls (*Ketupa*), and he establishes for them a new genus *Stringonax* (p. 515) with *B. blakistoni* as the type.

For *Hydropsalis lyra* Bp. he proposes the genus *Uropsalis* (p. 516) and for *Picus striatus* Müll. the genus *Chryserpes* (p. 517) on account of differences in relative length of quills and toes, and details of bill structure, from the genera *Hydropsalis* and *Centurus* to which they have been respectively referred. *Chryserpes* also exhibits striking peculiarities in coloration.

Mr. Miller besides erecting these new genera considers the status of allied groups already separated which is perhaps of even greater impor-

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[1] Descriptions of Seven New Subspecies and One New Species of African Birds (Plantain-Eater, Courser, and Rail). By Edgar A. Mearns. Smithsonian Misc. Collns., Vol. 65, No. 13, November 26, 1915.

[2] Food Habits of the Thrushes of the United States. By F. E. L. Beal. Bulletin No. 280, U. S. Dept. of Agriculture, September 27, 1915, pp. 1–23. (For sale by Supt. of Documents, Gov't. Printing Office, Washington, D. C., 5 cents.)

[3] Three New Genera of Birds. By W. DeWitt Miller. Bull. Amer. Mus. Nat. Hist., XXXIV, Art. XVII, pp. 515–520, New York, October 20, 1915.

tance, for even if we ultimately adopt broader genera than we do today, we must know more of the interrelations of the groups of species which are included within them, and which for taxonomic purposes must be distinguished by group names of some kind, even though not recognized nomenclaturally.— W. S.

Chapin on New Birds from the Belgian Congo.[1] — Mr. Chapin who accompanied Mr. Herbert Lang on an expedition to the Belgian Congo in the interests of the American Museum of Natural History is now engaged in working up the ornithological collections which they secured during their six years' sojourn (1909 to 1915). These comprise some 6200 skins representing about 600 species, and the present paper is the first publication based upon this material. Mr. Chapin's new species are *Chætura melanopygia* (p. 509), *Apaloderma minus* (p. 510) and *Criocleptes* (gen. nov.) *xenurus* (p. 512) all from Avakubi, Ituri District, Belgian Congo. Further publications upon this rich collection will be awaited with interest.— W. S.

Riley on New Birds from China and Japan.[2] — From material received by the U. S. National Museum from China and Japan, Mr. Riley has described three new forms as follows: *Tetrastes bonasia vicinitas* (p. 16), and *Dryocopus martius silvifragus* (p. 162) from Hakodate, Japan, and *Eophona melanura sowerbyi* (p. 163) from Chang Kow Hsien, Hupeh China.— W. S.

Recent Ornithological Papers by Dabbene.[3]— In the 'Anales of the Buenos Aires Mus., XXVII,' Mr. Dabbene proposes (p. 76) a new genus *Neophlæotomus* for the woodpecker, known as *Phlæotomus schulzi* Cab. and also describes an allied new species *N. shiptoni* (p. 79) from the province of Cordoba, with a colored plate of the male and female.

In two other short papers he reports *Manacus m. gutturosus, Harpiprion cayennensis, Dendrocygna discolor* and *Sporophila pileata* from Argentina, all of them being new to the fauna.— W. S.

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[1] Descriptions of Three New Birds from the Belgian Congo. By James P. Chapin. Bull. Amer. Mus. Nat. Hist., XXXIV, Art. XVI, pp. 509–513. New York, October 20, 1915.

[2] Descriptions of Three New Birds from China and Japan. By J. H. Riley. Proc. Biol. Soc. Washington, XXVIII, pp. 161–164, September 21, 1915.

[3] Description d'un Nouveau Genre et d'une Nouvelle Espèce de Pic Provenant du Nord-Ouest de la Republique Argentine. por Roberto Dabbene. An. Mus. Nac. Hist. Nat. Buenos Aires, XXVII, pp. 74–81, July 8, 1915.

Una ave nueva para la Argentina. por Roberto Dabbene. Bol. Soc. Physis. I, No. 7, pp. 435–436, Dec. 1914.

Otras especies de aves nuevas. por. Roberto Dabbene. *do.* pp. 532–533, June 10, 1915.

Mathews' 'The Birds of Australia.' [1] — With Volume V, Mr. Mathews begins the consideration of the hawks and eagles. These being conspicuous land birds have long engaged the attention of Australian ornithologists, and he is able to compile a much greater amount of information regarding their habits than was possible in connection with the families of water birds which have occupied the greater part of the preceding volumes. This fact however, in no way serves to curtail the very full discussion of taxonomy and nomenclature that has marked Mr. Mathews' work. He opens with an extended historical review of the classification of the Falconiformes in which, by the way, we find no reference to the publications of Robert Ridgway upon this subject, which surely deserve mention even though they did not cover the entire field. Following this is a discussion of the generic names of Lacepede's 'Tableaux' (1799). These were accompanied by diagnoses but with no species cited. The diagnoses are not full enough to enable us to determine with certainty what hawks he had in mind. Daudin however, in the Didot edition of Buffon (1802) republished Lacepede's diagnoses and cited several species after each, using his generic names. Mr. Mathews rejects Lacepede's names as *nomina nuda* and quotes the genera from Daudin "ex Lacepede." This is an easy way out of the trouble, but we do not think it is justified. Lacepede's names are not *nomina nuda* since they are accompanied by diagnoses. They are unidentifiable if we choose to so regard them, but in that case they preclude the use of the same names by any subsequent author just as do any other unidentifiable names. It seems to us that in such cases we must accept Daudin's action as a definite identification of Lacepede's names, but the names must, if used at all, date from Lacepede, 1799. The result is of course the same as that arrived at by Mr. Mathews, but does not conflict with the International Code.

Mr. Mathews treatment of subspecies in this volume is not quite clear. He puts them in the synonymy of the species and then tabulates them in the closing paragraphs without clearly distinguishing those which he regards as valid and those which are probably not.

We note the following new names proposed: subgenera; *Paraspizias* (p. 74) for *Sparvius cirrhocephalus*, and *Ictiniastur* (p. 146) for *Milvus sphenurus;* subspecies; *Circus assimilis quirindus* (p. 23) Celebes; and *Accipiter cirrhocephalus quæsitandus* (p. 81) Cape York.

We have heard a good deal about the destruction of hawks in this country but our efforts are apparently eclipsed in Australia, where bonuses were paid in 1899 for the slaughter of 7865 Wedge-tailed Eagles, while as late as 1903, 1060 of the same species were poisoned in eight months at one station. There is some justification in this slaughter as the birds are very injurious to lambs, but let us hope that this fine bird may be saved from absolute extermination! — W. S.

[1] The Birds of Australia. By Gregory M. Mathews, Vol. V, Part 1. Witherby & Co. London. November 5, 1915, pp. 1–152, pl. 234–244.

Shufeldt's Recent Papers on Avian Osteology and Fossil Birds.[1]— Following his paper on the 'Comparative Osteology of the Limpkin' (Anatomical Record, August, 1915), Dr. Shufeldt presents in the same journal another upon that of the Rails and Cranes. While in the body of this contribution he maintains his view set forth at the end of the former paper that the Limpkin is more closely related to the Rails then to the Cranes, in his conclusions he makes exactly the opposite statement. This, he explains in a 'Correction,' was due to an accidental substitution of a page from an old manuscript which was before him at the time, and which contained his former views on the matter. In spite of this, however, his conclusions seem to be hopelessly confused, as the scheme of classification set forth is not that of his earlier paper as he himself states in a footnote. Furthermore he distinctly endorses the arrangement of the Rallidæ and Grues in the 1910 edition of the A. O. U. Check-List where the Limpkin is included under the Cranes.

A recent study of the type specimen of the remarkable fossil bird *Gallinuloides wyomingensis* described by Eastman from Green River shales of Wyoming, confirms the opinion of Lucas that the bird is 'galliform' and not 'ralliform' but Dr. Shufeldt differs from Dr. Lucas in referring it to the true grouse instead of to the neighborhood of *Ortalis*. Dr. Shufeldt proposes for it a new genus *Palæobonasa* (p. 633) in case the canons of nomenclature are altered in the future to admit of the substitution of appropriate names for misnomers! — W. S.

Richmond on Necessary Changes in Generic Names.[2] — Dr. C. W. Richmond finds the current type designation of *Bolborhynchus* to be erroneous and *Myiopsitta catharina* Bon. is established as type, *Grammopsittaca* Ridgway becoming a synonym. For *Arara aymara* D'Orb. the supposed type of *Bolborhynchus*, a new name *Amoropsittaca* is proposed.

For *Stenopsis* Cassin, *Thermochalcis* (type *Caprimulgus cayennensis*) is proposed; *Oreomyias* Berlepsch becomes *Oreotriccus* (type *Pogonotriccus plumbeiceps* Lawr.); *Oreospiza* Ridgw. becomes *Oberholseria* (type *Fringilla chlorura* Aud.). *Lamprotes* Sw. becomes *Compsothraupis* (type *Tanagra loricata* Licht.); *Odontorhynchus* Leach becomes *Odontorchilus* (type *O. cinereus* Pelz.); all these names being found by Dr. Richmond to be preoccupied.— W. S.

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[1] Comparative Osteology of Certain Rails and Cranes, and the Systematic Positions of the Super-suborders Gruiformes and Ralliformes. By R. W. Shufeldt. Anatomical Record, Vol. 9, No. 10, October, 1915, pp. 731–750.

A Critical Study of the Fossil Bird *Gallinuloides wyomingensis* Eastman. Jour. of Geology, XXIII, No. 7, October–November, 1915, pp. 619–634.

[2] Note on the Generic Name Bolborhynchus Bonaparte. Proc. Biol. Soc. Wash., p. 183. November 29, 1915.

Notes on Several Preoccupied Generic Names (Aves). Proc. Biol. Soc. Wash., p. 180. November 29, 1915.

Gordon's 'Hill Birds of Scotland.' [1] — Well written popular biographies of birds are always interesting reading and when both the birds and their surroundings have figured so frequently in literature — both history and fiction — as have those of Scotland, an additional measure of interest is present. Such are the features which characterize Mr. Seton Gordon's 'Hill Birds of Scotland.'

He treats of two dozen of the more familiar birds of the Scottish highlands, drawing upon his own experience, which has evidently been extensive, and quoting appropriate information from various historic sources. "The hills" he says in his preface "do not yield the store of their knowledge easily; it is only to him who knows them in storm as in fine weather, and in the dead of winter as well as during long days of June sunlight, that they give a measure of their wisdom." The author is evidently of these fortunate ones, and his appreciation of nature and of his bird friends particularly is well brought out in the pages of his book. His general picture of the high hill country is particularly characteristic — "The mists curling smoke-like in the deep glens before the hour of sunrise, the distant hills, heavily snow-flecked, standing sharply against the horizon, the croaking of the Ptarmigan and the flute-like song of the Snow Bunting, all these things are among the priceless memories given by the Spirit of the Great Hills."

The species treated are the Golden Eagle, White-tailed Eagle, Osprey, Peregrine Falcon, Kestrel, Raven, Grey Crow, Ptarmigan, Black Grouse, Red Grouse, Capercaillie, Woodcock, Snipe, Goosander, Curlew, Greenshank, Golden Plover, Dotterel, Oyster Catcher, Snow Bunting, Dipper Crested Titmouse, Sandpiper and Dunlin. Nine of these are identical or only racially different from North American species, and their biographies are well worthy of study by the more serious American ornithologist who is seeking data on habits and behavior as well as the pleasure which is offered by an entertaining book.

It is regrettable to read under the head of the Osprey: "To give an account of the history of the Osprey in these islands is to chronicle a succession of regrettable events, events which are responsible for the loss to us of a noble bird, that in former days added a great charm to many a lonely loch hidden away amongst the Scottish hills. . . . These factors [in its extermination] are, the migratory instinct of the birds, and the large remuneration given by misguided collectors for British-taken eggs." The same causes apparently are responsible for the disappearance of the bird from much of the New Jersey seaboard where it was formerly abundant; fortunately, however, enough remain in this State to reëstablish the old breeding localities if proper encouragement be given.

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[1] **Hill Birds of Scotland. By Seton Gordon, F. Z. S., M. B. O. U. Author of "The Charm of the Hills" and "Birds of the Loch and Mountain." Illustrated. 1915, Longmans, Green, and Co., N. Y., London. Edward Arnold. 8vo., pp. i–xii + 1–300. $3. net.**

The history of the Capercaillie is particularly interesting. This bird became extinct in Scotland in the eighteenth century apparently owing to the destruction of the ancient Caledonian forest. In 1837 however, a number were brought from Sweden and liberated, which have increased and repopulated a large part of Scotland.

Thirty-five excellent plates of birds and their haunts from photographs illustrate this attractive book.— W. S.

Job's 'The Propagation of Wild Birds.' [1] — The rearing of wild birds, both upland game birds and waterfowl, has been making great headway during the past few years, until now an occupation which was almost unknown a decade ago is demanding literature and information for its guidance. In answer to this call the National Association of Audubon Societies has established a 'Department of Applied Ornithology' and the head of this department, Mr. Herbert K. Job, issues under this title the first 'Manual of Applied Ornithology.'

Those who have read Mr. Job's bulletins upon the rearing of wild birds issued by the National Association of Audubon Societies will understand the character of the present volume — a concise presentation of facts covering all phases of the subject. These are conveniently assembled and each topic conspicuously indicated by heavy-faced type, while a general index helps one to find the information which he desires. Numerous good half-tones from photographs illustrate the work.

The volume is divided into three parts devoted respectively to 'Gallinaceous Birds,' 'Waterfowl' and 'Smaller Land-birds.'

Under Part I. the Chapter headings are: 'General Methods'; 'Quail Propagation Method as a Basis'; 'The Grouse Family'; 'The Wild Turkey'; 'Pheasant Rearing'; 'Other Foreign Gallinaceous Species'; 'Pigeons and Doves'; 'Control of Vermin.' Under Part II: 'Wild Ducks'; 'Wild Geese'; 'Swans'; 'Wading Birds'; 'Refuges and Protected Colonies.'

These two parts are largely elaborations of the two bulletins above referred to which have already been noticed in these columns.

Part III which appeals more directly to the ornithologist and bird-lover comprises four chapters: 'Preliminary Matters'; 'Aids to Nesting'; 'Making Surroundings Attractive'; and 'Artificial Feeding.' These deal with helping birds to breed in a wild state rather than rearing them in captivity although the line between the two methods is perhaps more imaginary than real. Practical advice as to nesting boxes is given — how to build them, where to place them, etc., also how to provide nesting

[1] **The Propagation of Wild Birds. Manual of Applied Ornithology. Treating of Practical Methods of Propagation of Quails, Grouse, Wild Turkey, Pheasants, Partridges, Pigeons and Doves, and Waterfowl, in America, and of Attracting and Increasing Wild Birds in General, Including Song-Birds. By Herbert K. Job. Illustrated from Photographs Mostly by the Author. Doubleday, Page & Company, Garden City, New York, 1915. 8vo., pp. i–xxvii + 1–276.**

material for birds which do not use boxes — flax for Orioles, artificial mud puddles for Robins, etc. Baths, fountains, berry-bearing trees and food boxes also come in for detailed consideration and go to make up a book that is fully deserving of the subtitle which Mr. Job has bestowed upon it, 'A Manual of Applied Ornithology.' — W. S.

The Ornithological Journals.

Bird-Lore.[1] XVII, No. 5. September–October, 1915.

Bird Clubs in America. By F. M. Chapman.— Followed by reports on the work of seven such organizations.

Bird Photography and Suet Stations. By A. Jacot.

The Great Destruction of Warblers: An Urgent Appeal. By A. R. Sherman.

Migration of North American Birds. By W. W. Cooke.— Treats of the crested Titmice.

The Condor.[2] XVII, No. 5. September–October, 1915.

Characteristic Birds of the Dakota Prairies. I. In the Open Grassland. By Florence Merriam Bailey.

A Walking Eagle from Rancho la Brea. By L. H. Miller.— Description of a new species from this famous deposit, *Morphnus daggetti* (p. 180).

Estimated Average Age of the Herring Gull. By J. T. Nichols.— An interesting and suggestive paper.

A Late Nesting Record for the California Woodpecker. By H. W. Myers.

Description of a New Race of Savannah Sparrow and Suggestions on Some California Birds. By L. B. Bishop.— *Passerculus sandwichensis brooksi* (p. 187), Chilliwack, B. C. Notes on 15 other species.

A Partial List of the Summer Resident Land Birds of Monterey County, California. By J. R. Pemberton and H. W. Carriger.

The Oölogist.[3] XXXII, No. 10. October 15, 1915.

Odd Nesting of the American Merganser. By I. T. Van Kammen. No. 11, contains excellent photographs of Duck Hawk nests by J. B. Dixon.

The Ibis.[4] X Series. Vol. III, No. 4. October, 1915.

Report on the Birds collected by the late Mr. Boyd Alexander during

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[1] Organ of the Audubon Societies. Edited by F. M. Chapman. Published by D. Appleton & Co., Harrisburg, Pa. (Bimonthly) $1 per year.

[2] Edited for the Cooper Ornithological Club by Joseph Grinnell. Published at The Condor office, First Nat. Bank Building, Hollywood, Cal. (Bimonthly) $1.50 per year.

[3] Edited and published by R. M. Barnes, Lacon, Ill. (Monthly) $1. per year.

[4] Edited for the British Ornithologists' Union by W. L. Sclater. Published by Wm. Wesley and Son, 28 Essex St., Strand, London, W. C. (Quarterly) £1. 12s. per year.

his last Expedition to Africa.— Part V. Birds obtained in the Manenguba Mountains (Cameroon). By D. A. Bannerman.— 43 species.

Plumages of the Male Crossbill. By C. B. Ticehurst.— The author seems to have overlooked Dr. J. Dwight's account of the molts of this species (Ann. N. Y. Acad. Sci., XIII, p. 174–176, 1900) where he will find much detailed information. Dr. Dwight is of the opinion that the brick red plumage with red rump is attained by almost all birds at the post nuptial molt. Mr. Ticehurst, however, found several assuming yellow feathers at this time.

Ornithological Notes from the Alix and Buffalo Lake Districts, Province of Alberta, Canada, 1914. By C. B. Horsbrugh.— An annotated list of 80 species. The Grackles observed must have been *Quiscalus quiscula æneus* not *Q. quiscala quiscala* [sic.].

Studies on the Charadriiformes — II. On the Osteology of the Chatham Island Snipe (*Cœnocorypha pusilla*). By P. R. Lowe.— This curious bird is shown to be a relic of an earlier avifauna, a " living fossil " and the most generalized snipe known. Dr. Lowe considers it probably an outlying remnant of an earlier widespread stock of northern origin from which the present snipe and woodcock have sprung. Similar snipe of southern South America, etc., he thinks had a similar origin and does not regard them as evidence of an Antarctic continent from which all of these primitive types came.

Note on the Nestling Plumage of the Asiatic Golden Plover (*Charadrius dominicus fulvus*). By M. D. Haviland.

On Birds collected by Mr. C. Boden Kloss, on the Coast and Islands of Southeastern Siam. By H. C. Robinson.— One hundred species are listed of which four are described as new: *Pyrotrogon erythrocephalus klossi* (p. 735), Koh Chang; *Mesobucco duvaugli orientalis* (p. 738), Ok Yam; *Criniger ochraceus sacculatus* (p. 746), Geting Bidai, Selangor; and *Myiophoneus klossii* (p. 750), Koh Mehsi.

The Avifauna of Central America: a Study in Geographical Distribution. By W. P. Pycraft.

Bulletin of the British Ornithologists' Club.[1] No. CCIX. October 28, 1915.

Dr. Hartert described as new *Cyanoderma melanothorax baliensis* (p. 2), Bali. *C. m. melanothorax* from Java is a very rare bird and was overlooked in the British Museum Catalogue of Birds.

British Birds.[2] IX, No. 4. September, 1915.

Notes on the Breeding of the Asiatic Golden Plover. By Maud D. Haviland.— At the mouth of the Yenesei.

Screened and Open Nests of Redshanks. By C. W. Colthrup.

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[1] Edited by D. A. Bannerman. Published by Witherby & Co., 326 High Holborn, London, W. C. 6s. per year (nine monthly numbers).

[2] Edited by H. F. Witherby, 326 High Holborn, London, S. W. (Monthly) 10s., 6d. per year.

British Birds. IX, No. 5. October 1, 1915.

On "Wait and See" Photography. By E. L. Turner.— Admirable pictures of Sandpipers, Wagtail, etc.

On Incubation. By Eric B. Dunlop.— Birds which incubate from the laying of the first egg do so to protect their conspicuous eggs, is the opinion of the author. He also finds great mortality among the youngest (and consequently smallest) members of such broods, due to their failure to secure as much food from the parents as do the larger, stronger, members of the family.

Gannets Breeding on Bressay. By J. H. Gurney.

British Birds. IX, No. 6. November 1, 1915.

Richard M. Barrington. By C. B. Moffat.— With portrait.

Further Notes on the Moults and Sequence of Plumages in some British Ducks. By F. W. Smalley.— Agrees with Miss Jackson (do., pp. 34–42) that re-coloring cannot occur without molt. He differs in some details from her statements, and finds that many female ducks have a spring molt and an eclipse plumage.

Notes on the Great Northern Diver. By Eric B. Dunlop.— Good account of nesting in Canada; with photographs.

The Moults of the British Passeres with Notes on the Sequence of their Plumages. By H. F. Witherby.— Corvidæ, Sturnidæ and Oriolidæ.

Avicultural Magazine.[1] VI, No. 12. October, 1915.

The Ruddy Headed Goose. *Cloëphaga rubidiceps.* By H. D. Astley.

A Wonderful Collection of Birds from Ecuador. By H. D. Astley.— Some 60 species brought alive to England. Another note records the arrival in Paris of 30 live Hummingbirds from Venezuela.

Avicultural Magazine. VII, No. 1. November, 1915.

The Red-crowned Pigeon. *Alectrœnas pulcherrima.* By E. G. B. Meade-Waldo.— With incidents of a visit to the Seychelles.

A note in this number records a Scarlet Tanager kept in captivity for over 18 years.

The Emu.[2] XV, Part 2. October, 1915.

A New Honey-eater: *Macgillivrayornis claudi.* By W. Macgillivray.— Colored figure of this recently described bird.

Notes on the Yellow-bellied Shrike-Tit, *Falcunculus frontatus.* By A. H. Crisholm.

Comparative Osteology of Harris's Flightless Cormorant (*Nannopterum harrisi*). By R. W. Shufeldt.

Nesting of the Black Cormorant (*Phalacrocorax carbo*) in Tasmania. By Miss J. A. Fletcher.

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[1] Edited by Hubert D. Astley for the Avicultural Society. Published by West, Newman & Co., 54 Hatton Garden, London E. C. (Monthly) 15s. per year.

[2] Edited for the Royal Australasian Ornithologists' Union by J. A. Leach and C. Barrett. Published by Walker May & Co., 25 Mackillop St., Milbourne. (Quarterly).

The Admission of Colour-Genera. By G. M. Mathews.— A commentary on the recent discussion before the British Ornithologists' Club.

Observations on the Nankeen Night Heron (*Nycticorax caledonicus*). By S. A. Hanscombe.

Proposals for a second edition of the Official Check-list of the Birds of Australia are presented.

The South Australian Ornithologist.[1] II, Part 4. October 1, 1915.

Birds of the North and North-West of Australia. By G. M. Mathews. No. 4.

On some Pellets or Casts of a Screech Owl (*Tyto alba delicatula*). By S. A. White.

Field Notes in the Blue Mountains. By E. Ashby.

Revue Française d'Ornithologie. VII, No. 76–77. August–September, 1915. (In French.)

Some Observations on the Birds of Sfax, Tunis. By P. Bede.

The Snipe. By M. de la Furge.— Migration in Europe, etc.

Birds Observed in Morocco. 1884–1914. By H. and A. Vaucher.— Concluded.

Revue Français d'Ornithologie.[2] VII, No. 78. October 7, 1915.

On the Young of the Cagon (*Rhinochætus jubatus*). By A. Menegaux.— Breeding of a pair in captivity.

Observations on the Life Histories of the Birds of the Kerguelen Islands. By J. Loranchet.— Continued from No. 76–77.

Ardea.[3] IV, No. 3. September, 1915. (In Dutch.)

Meeting and excursion of the Netherland Ornithological Society.

Call Notes of *Anthus pratensis*. By H. Stadler and C. Schmitt.— An astonishing combination of musical and syllabic notation.

Ostrich raising in South Africa. By F. E. Blaauw.

Proceedings of the Bavarian Ornithological Society.[4] XII, No. 3. July 25, 1915. (In German.)

Songs and Call Notes of the Wood Lark (*Lullula a. arborea*). By Stadler and Schmitt.

Observations on the Australian Avifauna. By Prof. O. Maas.

On the Ornis of Java. By Max Bartels.— Discusses *Planesticus fumidus* (Müll.), *P. javanicus* (Horsf.) and *Collocalia gigas* Hartl. & Butl.

Some New Forms from the West Indies and Venezuela. By C. E. Hellmayr and J. Graf von Seilern.— *Mimus gilvus antillarum* (p. 201), Grenada; *Myiarchus tyrannulus sanctæ-luciæ* (p. 201), St. Lucia; *M. ferox*

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[1] Edited for the South Australian Ornithological Association by F. R. Zietz and others. Published quarterly by W. K. Thomas & Co., Adelaide. 8s. per year.

[2] Edited by A. Menegaux, 55 Rue de Buffon, Paris. (Monthly.)

[3] Edited for the Netherlands Ornithological Society by L. F. De Beaufort, A. Van Pelt Lechner and E. D. Van Oort. Published by E. J. Brill, Leyden. (Quarterly.)

[4] Edited by C. E. Hellmayr, Neuhauserstr. 51, Münich, Germany. (Quarterly.)

insulicola (p. 202), Tobago; *Dysithamnus mentalis cumbreanus* (p. 203), Las Quiguas, Ven.; *Leptotila verreauxi tobagensis* (p. 204), Tobago.

New Forms from the Neotropical Region. By C. E. Hellmayr.— *Euchlornis viridis chachapoyas* (p. 206), Chachapoyas, Peru; *Phaeochroa cuvierii berlepschi* (p. 208), Baranquilla, Colombia; *Psalidoprymna berlepschi* (p. 210), Anta, Cuzco, Peru; *Dryobates mixtus berlepschi* (p. 212), Mangrullo, W. Patagonia; *Pionopsitta amazonina theresæ* (214), El Escorial, W. Venezuela.

Ornithologische Monatsberichte.[1] 23, No. 7–8. July–August, 1915. (In German.)

Observations on Some Points in the Accounts of the Propagation of Our Cuckoos which are in need of Explanation. By R. Schlegel.

Remarks on *Carpodacus erythrinus* and its Forms. By E. Hesse.— *C. e. erythrinus, kubanensis* and *roseatus* recognized.

New Forms. By Reichenow.— *Chlorophoneus quadricolor intercedens* (p. 120), Useguha, German E. Africa; *Pomatorhinus australis damarensis* (p. 120), Windhuk, German S. W. Africa.

Journal für Ornithologie. Vol. 63, Heft. 3. July, 1915. (In German.)

The Characteristics of the Flight Feathers of the Birds of Northwestern Germany. By H. Reichling.

A New Contribution to the Ornithology of Saghalin. By E. Hesse.— 91 species listed. *Bubo bubo borissowi* (p. 366) and *Anthus borealis* (p. 386) are described as new.

Annual Report (1914) of Bird Study at Rossiten. By J. Thienemann.

Messager Ornithologique.[2] VI, No. 3. 1915. (In Russian.)

Notice of the Birds of the Vicinity of Tomsk. By P. and J. Zalesski.

Bombycilla garrulus ussuriensis (p. 223). By S. A. Buturlin.— From Lake Khanka, S. Ussuri-land.

Bubo bubo zaissanensis (p. 224). By W. A. Hachlow.

Sterna hirundo turkestanensis (p. 226). By N. A. Sarudny.

On *Falco altaicus* and *F. lorenzi*. By P. Sushkin.

Notes on the Palæarctic Forms of Pinicola enucleator. By S. A. Buturlin.— *P. e. urupensis* (p. 239) n. subsp. from Urup Isl., Kurile. Five races recognized, but *P. e. pacata* Bangs regarded as an individual monstrosity.

Birds collected by A. P. Velezhanin in the Basin of the Upper Irtysh. By G. I. Poljakow.

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[1] Edited by Dr. A. Reichenow. Published by R. Friedlander & Son, Berlin, 6. Karlstr 11. (Monthly) 6M. per year.

[2] Edited by G. Poljakow, Gut "Sawino," Postabteilung Objralowka, Moscow Govt. Russia.

Ornithological Articles in Other Journals.[1]

Riley, J. H. Note on *Chlorostilbon puruensis* Riley. (Proc. Biol. Soc. Wash., XXVIII, p. 183, November 29, 1915.) — This recently described species proves to be a *Chlorestes* close to *C. cæruleus* of which it may be regarded as a subspecies.

DeWar, J. M. The Relation of the Oystercatcher to its Natural Environment. (The Zoologist, August–November, 1915.)

Bell, Alfred. Pleistocene and Later Bird Fauna of Great Britain and Ireland. (The Zoölogist, November, 1915.)

Clarke, Wm. Eagle. The Wren of St. Kilda: Its Status, Plumages, and Habits. (The Scottish Naturalist, October, 1915.) — A good account of *Troglodytes troglodytes hirtensis* (Seebohm).

Clarke, John M. Protection of the Sea Fowl of the Gulf of St. Lawrence (Report Sixth Ann. Meeting Comm. of Conservation of Canada.) — An able plea for the protection of the colonies at Percé Rocks and Bonaventure Island. The same volume contains articles on the same subject by C. Gordon Hewitt and P. A. Taverner. All illustrated by excellent photographs of Cormorants, Gannets, etc. The government is urged to establish these rookeries as well as Pt. Pelee as bird refuges.

Kerr, J. Graham. Notes on the Habits of the Rhea. (Proc. Royal Phys. Soc., 1915, pp. 200–203.) — In Paraguay.

Killermann, S. On the Extinct, Mascarine Birds. (Naturwiss. Wochenshrift, XIV, pp. 353–360.) — The Dodo. (In German.)

Coburn Charles A. A Study of the Behavior of the Crow, *Corvus americanus* Aud., by the Multiple Choice Method. (Jour. Anim. Behavior, V. pp. 75–114.) — *cf.* also do., IV, pp. 185–201.

Wilkinson, O. J. The Great Crested Grebe. (Wild Life, VII, No. 4, October, 1915.).— Beautiful photographs.

Selous, E. The Little Grebe. (Wild Life, VII, Nos. 2–4.) — Well illustrated.

Thayer, G. H. The End of Cory's Shearwater. (Science, September 3, 1915.) — Regards it as a synonym of *Puffinus kuhli.*

Stone, W. The End is Not Yet! (Science, October 15, 1915.) — Shows that Cory's Shearwater (*Puffinus borealis*) is not a synonym of *P. kuhli* and that whether or not it be identical with the Azores bird, *P. borealis* is the oldest name for *any* north Atlantic member of the group.

Ridgway, R. A New Pigeon from Jamaica. (Proc. Biol. Soc. Wash., XXVIII, p. 177, November 29, 1915.) — *Chlorœnas inornata exigua.*

Publications Received.— **Barrows,** H. R. The Histological Basis of the Different Shank Colors in the Domestic Fowl. (Ann. Rept. Maine Agr. Exper. Sta. for 1914, pp. 237–252.)

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[1] Some of these journals are received in exchange, others are examined in the library of the Academy of Natural Sciences of Philadelphia. The Editor is under obligations to Mr. J. A. G. Rehn for a list of ornithological articles contained in the accessions to the library from week to week.

Beal, F. E. L. Food Habits of the Thrushes of the United States. (Bull. 280, U. S. Dept. Agriculture, September 27, 1915.)

Chapin, James P. Descriptions of Three New Birds from the Belgian Congo. (Bull. Amer. Mus. Nat. Hist., XXXIV, Art. XVI, pp. 509–513, October 20, 1915.)

Cooke, W. W. Distribution and Migration of North American Gulls and their Allies. (Bull. 292, U. S. Dept. Agriculture, October 25, 1915.)

Curtis, Maynie R. Relation of Simultaneous Ovulation to the Production of Double-yolked Eggs. (Jour. Agr. Research, U. S. Dept. Agr., III, No. 5, pp. 375–386.)

Dabbene, Roberto. (1) Description d'un Noveau Genre et d'une Nouvelle Espèce de Pic Provenant du Nord-ouest de la Republique Argentine. (Ann. Mus. Nac. Hist. Nat. Buenos Ayres, XXVII, pp. 75–81, July 8, 1915.) (2) Una ave nueva para la Argentina (Bol. Soc. Physis, I, No. 7, December, 1914.) (3) Otras especies de aves nuevas (do. I, pp. 532–533.)

Fleming, J. H. A New Turnagra from Stephens' Island, New Zealand. (Proc. Biol. Soc. Wash., XXVIII, pp. 121–124, May 27, 1915.)

Gaige, F. M. The Birds of Dickinson County, Michigan. (Sixteenth Rept. Mich. Acad. Sci., pp. 74–91.)

Gordon, Seton. Hill Birds of Scotland. Longmans, Green, and Co., Fourth Ave. and 30th St., N. Y. Edward Arnold, London. 8 vo. 1915. pp. 1–300. $3.00 net.

Grinnell, Joseph. A Distributional List of the Birds of California. (Pacific Coast Avifauna, No. 11, Cooper Ornith. Club. October 21, 1915.)

Job, Herbert K. The Propagation of Wild Birds, A Manual of Applied Ornithology. Doubleday, Page & Co. Garden City, New York, 1915. 8vo. pp. i–xxvii + 1–276. $2. net.

Mathews, Gregory M. The Birds of Australia. Vol. V, Part I, November 5, 1915. London, Witherby & Co.

Mearns, Edgar A. Descriptions of Seven New Subspecies and one New Species of African Birds. (Plantain-Eater, Courser, and Rail.) (Smithson. Misc. Collns., Vol. 65, No. 13, November 26, 1915.)

Miller, W. DeWitt. Three New Genera of Birds. (Bull. Amer. Mus. Nat. Hist., XXXIV, Art. XVII, pp. 515–520, October 20, 1915.)

Palmer, T. S., Bancroft, W. F., and Earnshaw, F. L. Game Laws for 1915. (Farmers' Bull. 692, U. S. Dept. Agr., September 14, 1915.)

Richmond, Chas. W. (1) Notes on several preoccupied generic names (Aves). (Proc. Biol. Soc. Wash., XXVIII, p. 180, November 29, 1915.) (2) Note on the Generic Name Bolborhynchus Bonaparte. (*do.*, p. 183, November 29, 1915.)

Ridgway, R. A New Pigeon from Jamaica. (*do.*, p. 177, November 29, 1915.)

Riley, J. H. (1) Descriptions of Three New Birds from China and Japan. (*do.*, pp. 161–164, September 21, 1915.) (2) Note on *Chlorostilbon puruensis.* (*do.*, p. 183, November 29, 1915.)

Shufeldt, R. W. (1) Comparative Osteology of Harris's Flightless Cormorant (*Nannopterum harrisi*). (Emu, XV, Pt. 2, October, 1915, pp. 86–114.) (2) Nature-Study and the Common Forms of Animal Life. II. (Nature Study Review, II, No. 7, October, 1915.) (3) A Critical Study of the Fossil Bird *Gallinuloides wyomingensis* Eastman. (Jour. of Geology, XXIII, No. 7, October–November, 1915.) (4) Comparative Osteology of Certain Rails and Cranes, and the Systematic Positions of the Super-suborders Gruiformes and Ralliformes. (Anat. Record, Vol. 9, No. 10, October, 1915.) (5) Eggs of North American Water Birds (Part III). (Bluebird, September, 1915.) (6) The Quarrelsome Kingbird. (Our Dumb Animals, November, 1915.) (7) Red-headed Woodpecker. (*do.*, December, 1915.) (8) Don't shoot the Owls. (The Country Gentleman, October 30, 1915.)

Thorburn, A. British Birds. Longmans, Green and Co. London, 1915. 4°. Vols. I and II. $10 per volume.

Tschusi zu Schmidhoffen, Viktor Ritter von. (1) Übersicht der Vögel Oberösterreichs und Salzburgs. (Ornith. Jahrbuches, December, 1914.) (2) Lautäusserungen der Sperlingseule, *Glaucidium passerinum* (L). (*do.*, 1914, XXV, Heft. 3–4.) (3) Zoologische Literatur der Steiermark, Ornithologische Literatur. (Mittl. Naturwiss. Verein. Steiermark, 1914, Band 51.) (4) Ornithologische Kollektaneen aus Österreich-Ungarn. (Zool. Beobachter, LVI, Heft. 6–9, 1915.) (5) Ankunfts- und Abzugsdaten bei Hallein (1914). (Orn. Monatschr., XL, No. 4.) (6) Ornithologische Literatur Österreich-Ungarns, Bosniens und der Herzegowina, 1913. (Verhl. Zool.-Bot. Gesellsch. Wien., 1915.)

Wood, Casey A. The Eyelids and Lachrymal Apparatus of Birds. (Ophthalmology, July, 1915.)

Abstract Proc. Zool. Soc. London, Nos. 146–149.

American Museum Journal, The, XV, No. 6 and 7, October and November, 1915.

Ardea, IV, No. 3, September, 1915.

Austral Avian Record, III, No. 2, November 19, 1915.

Avicultural Magazine, (3) VI, No. 12, VII, No. 1, October and November, 1915.

Bird-Lore, XVII, Nos. 5 and 6, September–October, November–December, 1915.

Bird Notes and News, VI, Nos. 6 and 7, Summer and Autumn, 1915.

British Birds, IX, Nos. 5 and 6, October and November, 1915.

Bulletin British Ornith. Club, No. CCIX, October 28, 1915.

Bulletin of the Charleston Museum, XI, Nos. 6–7, October–November, 1915.

California Fish and Game, I, No. 5, October, 1915.

Condor, The, XVII, No. 5 and 6, September–October, November–December, 1915.

Current Items of Interest, Nos. 26, November 15, 1915.

Emu, The, XV, Part 2, October, 1915.

Fins, Feathers and Fur, Bull. Minn. Game and Fish Com., No. 3, September, 1915.

Forest and Stream, LXXXV, Nos. 9–12, September to December, 1915.

Ibis, The, (10) III, No. 4, October, 1915.

Messager Ornithologique, VI, No. 3.

Oölogist, The, XXXII, Nos. 9–11, September–November, 1915.

Oregon Sportsman, The, III, No. 8, October, 1915. (Quarterly.)

Ottawa Naturalist, The, XXIX, Nos. 5–6 and 7, August–October, 1915.

Philippine Journal of Science, X, Nos. 2 and 3, March and May, 1915.

Revue Française d'Ornithologie, VII, No. 78, October, 1915.

Science, N. S., XLII, Nos. 1081–1094.

Scottish Naturalist, The, Nos. 45 to 47, September to November, 1915.

South Australian Ornithologist, The, II, Part 4, October, 1915.

Verhandlungen der Ornith. Gesellsch. in Bayern, Band XII, Heft. 3, July, 1915.

Wilson Bulletin, The, XXVII, No. 3, September, 1915.

Zoologist, The, XIX, Nos. 225–227, September to November, 1915.

CORRESPONDENCE.

EDITOR OF 'THE AUK'.

Dear Sir: —

I note that in the October number of 'The Auk,' Mr. Robert Thomas Moore presents some criticisms of what I have chosen to call the graphic method of recording bird songs. Since Mr. Moore credits me with a statement that I did not make, and since many of the faults he finds are the result of misunderstanding, or exist principally in his own imagination, I should like to take a little space to answer him.

In the beginning we must realize that it is our intention to study bird songs, not from the standpoint of a musician but from that of a scientist. We care little for the fact that musicians do not consider pronunciation a factor worth dealing with. If it has no application to bird music, it makes little difference what the musician's definition of a trill is. If musicians consider that the duration of a song in seconds is of secondary importance to them, that is no reason why it is of secondary importance to the scientist. The bird-lover may care little about the amount of white on the junco's tail. All he wants to know is that it is a junco, after which he spends his time admiring the dainty contrast of its colors. But to the student of bird plumages the amount of white is important, and there may be cases where such a character becomes of extremely great importance. The same thing applies to bird song. The length of a song is one of its characters, a character that may be specific, that may have just as great, or even greater im-

portance than that the bird sings in triple time. When the bird does not sing in any particular time, the duration of the song in seconds is practically the only time character that we can record with accuracy.

Mr. Moore founds a large amount of his criticism on his evident belief that I denied the existence of rhythm in bird songs in general. When one assumes the rôle of critic it becomes his duty to read carefully that which he is going to criticise. Otherwise he is liable to waste space and time criticising errors that originated in his own faulty reading or interpretation. I was particularly careful not to deny the existence of rhythm in bird songs, for I was entirely aware that some of my records were rhythmic. What I did wish to make clear was that a great many bird songs are not rhythmic, and that for that reason a method of recording time which depends on a mathematical relation between the durations of single notes is not suited to bird songs.

Mr. Moore makes some curious distinctions between the meanings of the words time and duration, and concludes from this that I have ignored time and rhythm. Does Mr. Moore think that I measure the duration of the song as a whole, only? Does he believe that the lengths of the separate notes on the record are meaningless? This is evidently what he does think, for how else could he conclude that the graphic method does not record rhythm? How else could he get the notion that the rhythm in some of the records is obscured by the method? What difference would it make had I used the word time instead of duration? None whatever, for duration and time are one and the same factor. Mr. Moore would have us think that duration does not include rhythm. Yet he himself says that a knowledge of "the relative duration of the individual notes of a song. . . .would result in some knowledge of the song's rhythm." That is true. And in some cases it would result in a knowledge of the song's lack of rhythm. Mr. Moore implies that I am unable to record rhythm by the graphic method, yet he proves the contrary himself. He tells us that he has found rhythm in some of the records, particularly that of the robin. Yes, the rhythm is there, showing plainly at a glance. Mr. Moore, with his musician's mind, must needs reduce it to measures and triple time in order to see it, but those who are not so well versed in music can see it too, by the horizontal lengths of the phrases and pauses. Rhythm, when it exists, can be recorded by the graphic method just as accurately as by any other. Even when it is retarded or accelerated the stop-watch checks it up, in spite of Mr. Moore's statement to the contrary, and not only checks it, but shows just how much retardation and acceleration there is.

But it is when the song does not happen to be rhythmic that the graphic method shows its greatest utility. The old method must make the song rhythmic in order to record it. Every note of the song must have a mathematical relation in length to every other note. Now a bird may sing notes, the relative durations of which are totally incommensurable. Shall we change such a song in order to make it fit our method? Is such a proceeding scientific accuracy? Or is it the conception of a musician, so

trained in the rules and necessities of human music that he is unable to conceive of music that is not rhythmic? Is it not far preferable to change the method to fit the song?

In the matter of pitch Mr. Moore decides that the graphic method, since it requires twelve horizontal lines, is much too complicated. He uses much space telling how numerous the lines would have to be in order to record the pitch of a note with absolute accuracy. Undoubtedly there would have to be not merely a few thousand lines but an infinite number. Our accuracy in recording pitch is limited by the accuracy of the human ear in perceiving it. It is unnecessary to record the note more accurately than we can hear it.

If the horizontal lines were all that counted, five lines would be far simpler than twelve. But we must bear in mind a few of the other intricate necessities of the old system. We must begin our staff with a clef. We must decide on some key in which the bird is supposed to sing, and indicate this by anything from five sharps to five flats, carefully placed on their proper lines or spaces. We must use more of these sharps and flats, and also a few natural signs, whenever the bird happens to forget to which key the recorder has assigned his song. If the bird forgets frequently, we have the alternative of changing the key, which is slightly less intricate. We must add lines above or below the staff every time the bird strays out of the limits of the original five. We must add some more marks at the top to indicate how many octaves above middle C the bird sings. Combined with all this we must keep constantly in mind the fact that at certain places on the staff the interval between a line and a space is half a tone, while in others it is a whole tone. Five lines may be very simple, but considering all that goes with it I much prefer twelve, or even thirty-six. Yet Mr. Moore tells us that this method is more simple and comprehensive than the graphic!

To go back to the matter of time, we find here also a complicated system. A number precedes the song which tells the number of beats to the measure. Another number at the top tells the number of beats to the minute. Each separate note must be one of a dozen or so sorts, indicative of its duration in beats. At the top we must write retards and accelerations, which do not show with accuracy how much of the song is retarded or accelerated, nor how great is this change in time. The whole method, taking pitch and time together, is so intricate that, in order to use it with anything like celerity, one must be educated in its use from his youth up. The accurate recording of a bird's song in the field is a difficult matter in itself. Why complicate it by a difficult method when we may make one that is reasonably simple? This "splendid system....evolved by ages of use" may do very well for human music, but it is clearly not applicable to that of birds.

In the matter of pitch Mr. Moore concludes that the old method is more accurate. What he means is, not that the song as it naturally is can be more accurately recorded, but that, after it has been artificially changed in both pitch and time to fit the method, the pitch of the recorded notes is

more definite. What we desire is a record of the bird's song as it is, not as we think it ought to be. We cannot fit wild bird songs to our standards of music. Then why not fit our method of making records to the bird songs? Mr. Moore would have us believe that a method which cannot record the pitch of a bird's song closer than a half-tone is more accurate than a method that can record it closer than a quarter tone. Absolute accuracy is out of the question, but relative accuracy should be as close as the human ear can make it, and not limited by the graded pitches allowable in human music.

In this matter of pitch and accuracy of record I wish to explain that it is entirely possible to use different colors for the coördinate lines, and the lines representing the song. This obviates the necessity of making the song lines heavier than the others, and thus makes the location of the pitch of each note plainer. I hoped at first to have this done with the figures used to illustrate my article. In work in the field I do this by simply using quadrille paper note-books, in which the lines for both time and pitch are already drawn in light blue. Such a note book has the advantage of being purchasable almost anywhere, either in ordinary or loose-leaf form. With such a note-book it makes little difference whether twelve or thirty-six lines are necessary to record a given song. With two colors I have been able to indicate an accented note, or other notes of greater intensity than the main song by simply making the lines, representing these notes, heavier when recorded in pencil, and broader when recorded in ink.

The factor of pronunciation Mr. Moore considers of little importance because musicians do not recognize it as a part of music. Pronunciation may have nothing to do with music, but it has a great deal to do with bird songs. The liquid l is an extremely important factor and its presence or absence is of great assistance in the recognition of a song in the field. But Mr. Moore wishes to have pronunciation classed as a sub-head under quality. What it has to do with quality is hard to see. Too many people already have quality, intensity and pitch, hopelessly confused, so why mix pronunciation with it? Quality depends entirely on the presence or absence of certain overtones, and the relative intensity of these overtones. Quality includes nothing else. Is it scientific to make it include pronunciation?

Mr. Moore tells us that the presence of marks indicating pronunciation blurs the pitch of the note. If the loop used to indicate an l sound, starts at a certain definite point and ends at that point, making no progress horizontally or vertically it blurs neither pitch nor time. This is another objection evidently originating in Mr. Moore's imagination.

Too great a musical knowledge in some cases is liable to result in too little along other important lines. It is liable for instance to make one conclude that such a term as "trill" has only one meaning. Looking up "trill" in Webster's dictionary I find that my definition is more correct for the ordinary use of the word than Mr. Moore's. The musical trill, which Mr. Moore considers the only real trill, is referred by Webster to the word "shake." The ordinary trill is defined in the dictionary as a single note, interrupted by the regular recurrence of a consonant sound.

Whether the trills of birds are caused in this way or by rapid repetition of a note is hard to say. There seem to be reasons for thinking that trills are caused in both ways in bird song. But Mr. Moore's shake must be rare in bird music, and is certainly not worth bothering our heads about. Ornithological literature abounds in the use of the word trill, describing these phenomena of bird songs. Yet our critic considers these writers all wrong because this trill is not one in the strict, narrow, musical use of the term. He further concludes that my records are rendered inaccurate for the same reason, although even to Mr. Moore, who supposed all trills were shakes, what I meant by trill was perfectly plain.

Mr. Moore objects to the term "graphic method" because the old system is also graphic. In the broadest sense of the word "graphic" he is right. But "graphic method" has become particularly associated in recent years with methods of recording various facts, mathematical and otherwise, by the use of coördinates. In that sense this title is particularly appropriate.

My aim in introducing the graphic method was to show that more accurate methods than the old system of musical notation could be devised. The old method when applied to bird songs has been almost universally recognized as a failure. A familiar bird song, written on the musical scale, looks unfamiliar, even to the man who understands musical symbols. The result when it is played on the piano with an accompaniment of chords is absolutely ludicrous. Anyone can see that the reason for this is the inaccuracy of the old method, in its attempts to put together a method and a variety of music that were not made for each other. The graphic method does away with these difficulties, as well as the temptation to write chord accompaniments and to play the song on the piano. It records the song simply and naturally, and so graphically that anyone can see its meaning at a glance. It becomes familiar after very little study, and its use in the field is much easier than the intricate system of symbols of the old method. In a word it is far more accurate, far more comprehensive and far more simple.

I do not wish to convey the impression that I believe the graphic method perfect. Seldom if ever is a new idea brought out by one person that cannot be improved by someone else. I would gladly welcome suggestions, criticisms or improvements that are constructive in nature, and not based on misinterpretation, or evident wish to make unqualified condemnation. I believe thoroughly in the principle back of the graphic method, and I am willing to leave its fate to the test of time, having confidence that the old method with its inaccuracies and complications must go, and that in the future either this method or something based on similar ideas will be generally used by students of bird song. I hope in some future time to present more studies of bird song based on the graphic method, and after further field study to go into the subjects of intensity and pronunciation more deeply.

ARETAS A. SAUNDERS.

New Haven, Conn.
Oct. 30, 1915.

[Both Mr. Saunders and Mr. Moore seem agreed that some sort of 'graphic' representation of bird song is preferable to the syllabic method. Choice between their methods is largely a matter of personal opinion and both having been exploited at considerable length it seems hardly desirable to continue the discussion further in these columns. A note by Mr. Summers in General Notes, p. 78, *antea*, as well as Mr. Oldys' paper, p. 17, deal further with this subject. Ed.].

On the Position of the *Aramidae* in the System.

Editor of 'The Auk.'

Dear Sir: —

Your very interesting notice of my two recent osteological papers, which appeared in 'The Auk' for October, 1915 (pp. 517, 518), seems, in one instance at least, to demand a few words from me by way of defence.

Dr. Mitchell's conclusions are only known to me through my having seen the notice of his paper in the 'Abstract of the P. Z. S.' of May 25, 1915, p. 34. There I read that he read, as Secretary of the Society, "a communication on the Anatomy of the Gruiform birds, *Aramus giganteus* Bonap., and *Rhinochetus kagu*, in which he showed that *A. giganteus* resembled *A. scolopaceus* very closely in the details of its muscular and bony anatomy, and that the genus *Aramus*, in these respects, was very close to the true Cranes."

That the two species of *Aramus* are very much alike in their morphology will, of course, not be questioned; but that these birds are "very close to the true Cranes" structurally, is a statement which I contend cannot be sustained, nor does the anatomy of the several forms demonstrate it. In a paper I published as long ago as 1894 (Jour. Anat. and Phys. London, Oct., Vol. 29, n. s., Vol. 9, pt. I, art. 5, pp. 21–34, text figures), I carefully contrasted, in three parallel columns, the essential osteological characters of *Rallus longirostris*, *Aramus vociferus*, and *Grus americanus;* and this comparison demonstrated the fact that *Aramus* had more rail characters in its skeleton than gruine ones. My subsequent publications on the subject practically sustained this opinion. Finally, the paper of mine, which you kindly noticed in 'The Auk,' is entitled "On the Comparative Osteology of the Limpkin (*Aramus vociferus*) and its Place in the System," a contribution to the subject which recently appeared in 'The Anatomical Record' (Vol. 9, No. 8, Aug. 20, 1915, pp. 591–606, figs. 1–14). In this paper I thought I showed very clearly that, osteologically, the *Aramidæ* were nearer the *Rallidæ* than they were to the *Gruidæ*. Other anatomists have arrived at the same conclusion. But to discuss all of these opinions would occupy far more space than necessary in the present connection; so I shall confine myself to what one of the most painstaking and able avian anatomists had to say on the subject. I refer to the splendid work of William Macgillivray, who prepared all the bird dissections of American birds for Audubon's great work on "Birds of America." Macgillivray

paid unusual attention to the anatomy of the Limpkin (*Aramus*), which Audubon called the "*Scolopaceous Courlan*," and his studies of it appear in Volume V (pp. 184–187). There is one full-page illustration devoted to the digestive tract and the trachea or windpipe. Audubon evidently believed the bird to be a big Rail; and in so far as its habits and nesting were concerned, "very nearly allied to *Rallus elegans*." After rendering his account of it, Macgillivray's follows immediately, and among other things he points out that "this remarkable bird has exercised the ingenuity of the systematizing ornithologists, some of whom have considered it as a Heron, others a Crane, while many have made it a Rail, and many more a genus apart, but allied to the Rails, or to the Herons, or to both. It seems in truth to be a large Rail, with the wings and feet approaching in form to those of the Herons; but while frivolous disputes might be carried on *ad libitum* as to its location in the system of nature, were we merely to consider its exterior, it is fortunate that we possess a means of determining its character with certainty; — if we examine its digestive organs, we shall at once see if it be a Rail, or a Heron, or anything else. If a Heron, it will have a very wide œsophagus, a roundish, thin-walled stomach, very slender intestines, and a single short obtuse cœcum; if a Rail or Gallinule, or bird of that tribe, it will have a narrow mouth, a narrow œsophagus, a very muscular stomach, intestines of moderate width, and two moderately long, rather wide cœca."

Following this, Macgillivray states that he has before him two specimens of the Limpkin, which were shot in Florida and preserved in spirits, and he sets forth in the ensuing three paragraphs his account of their anatomy. "Now, in all this," he adds, "there is nothing indicative of any affinity to the Herons; the structure of the intestinal canal being essentially like that of the Coots, Gallinules, and Rails. Even the external parts sufficiently indicate its station, the bill, the plumage and the coloring being more like those of the Rallinæ than of any other family.

"The Prince of Musignano, who first described this bird as a Rail, *Rallus giganteus*, afterwards adopted for it Vieillot's genus *Aramus*, and considered it as belonging to the *Ardeidæ*, forming a connecting link with them and the *Rallidæ*, and 'aberrating somewhat towards the *Scolopacidæ*, as well as tending a little towards the *Psophidæ*, sub-family *Gruinæ*,' and claiming 'again a well-founded resemblance to the most typical form of the genus *Rallus*.' Finally, he reverts to his original idea, and places it at the head of the *Rallidæ*. Mr. Swainson refers it to the *Tantalidæ*, associating it with *Anastomus*, *Tantalus*, and *Ibis*, to which it certainly has very little affinity in any point of view."

Under date of September 14, 1915, I have an interesting letter from my esteemed correspondent, Herr. Prof. Dr. H. von Ihering, Director of the Museu Paulista, São Paulo, Brazil, in which he says: "Your letter of the 6th of August has given me the satisfaction to see that you are in accordance with me in separating the *Aramidæ* from the famous 'family' of *Gruidæ*. . . . .It was a very useful and necessary work of you to study the anatomy of *Aramidæ* and its allies."

After the above had been written my attention was invited to a peculiar conformation of the trachea in *Aramus vociferus* by Dr. Edgar A. Mearns at the U. S. National Museum. He tells me that several years ago he collected a *male* specimen in Florida, and that he observed in it that the lower part of the trachea, above the bronchial bifurcation, formed a loop or convolution, which extended posteriorly to rest on the outer surfaces of the pectoralis major muscles, much as we find it in *Ortalis*. Dr. Mearns prepared this specimen and presented it to the United States National Museum, and a few days ago I made an effort to locate it through the kind assistance of Dr. C. W. Richmond. We were unsuccessful in our search, and so the matter stands at present.

I mention above a dissection of Macgillivray of *Aramus*. He had both a male and a female bird at hand when he wrote out his anatomical notes on this species for Audubon; but he evidently did not observe this peculiarity of the windpipe in the male bird. He figured the trachea of the *female*, in which sex the aforesaid convolution does not take place, and he doubtless used the male specimen for other purposes.

Dr. Mearns also collected a female Limpkin, and the skeleton is in the National Museum collections. I have examined it there, and I find that no such looping of the windpipe is preser ; in it. Possibly this structure may have been described somewhere or other and I have never run across it; in the event it has not been described, however, Dr. Mearns is fully entitled to the credit of having first discovered it.

If this letter chances to be read by any one interested in the anatomy of birds in Florida, I would be very glad to communicate with him and arrange to have a male specimen of an adult Limpkin sent me, in that I may figure and fully describe this condition.

In closing I would invite attention to the excellent paper by Dr. F. E. Beddard on the osteology of *Aramus scolopacus* (*Ibis*, (8) II., 1902, pp. 33–54, numerous figures), which is a valuable contribution to this subject.

As this communication goes to you, another article of mine appears in 'The Anatomical Record,' entitled the "Comparative Osteology of Certain Rails and Cranes, and the Systematic Positions of the Supersuborders Gruiformes and Ralliformes." (Vol. 9, No. 10, Oct. 20, 1915, pp. 731–750, figs. 1–9). A very unusual and remarkable slip has taken place in this article; for, at the time I was engaged upon its preparation, and had completed it for the press, two manuscripts were before me, namely, the old one, published years ago when I considered that the *Aramidæ* was a family belonging among the Cranes and their allies (*Gruiformes*), and the remodeled one, in which my present views were set forth. In assembling the pages, the *old* page, upon which the Classification and some of the remarks under "Conclusions" appeared, was accidentally substituted for the new one carrying the new classificatory scheme upon it. In this shape it was handed over to be typewritten. When galley proof came to hand, I was extremely busy with other work, and it was therefore turned over to an expert proofreader and most carefully corrected. This proofreader

knew nothing of the classification of birds, however, and so the galleys went forward with the result now to be found in "The Anatomical Record" (Vol. 9, No. 10, Oct. 20, 1915, pp. 749–750).

In so far as my present views are concerned with respect to the position of the *Aramidæ* in the system, they are correctly set forth in "The Anatomical Record" of August 20, 1915 (Vol. 9, No. 8, pp. 591–606).

Faithfully yours,

R. W. Shufeldt.

NOTES AND NEWS.

Systematic zoölogy occupies a peculiar position in the field of science, in that its publications are to a certain extent privileged — *i. e.* protected by laws which do not pertain to other scientific publications. The latter are judged on their merits and an author who is guilty of slipshod careless writing, or whose publications are ambiguous or insufficient, is ignored; the merits of his work discounted, and his conclusions questioned. In other words he loses caste in the scientific world. Not so the describer of new species. No matter how bad or inadequate his diagnosis or how unnecessary the naming of the species, a name once proposed has nomenclatural status, and is a part of systematic science — for this matter is governed by the rules of nomenclature.

These rules were formulated mainly for the purpose of dealing with the earlier literature of zoölogy where names were proposed by writers who did not realize their responsibilities and did not consider the importance of making their descriptions adequate for the future. Obviously if we are to have stability of nomenclature on a basis of priority all of these earlier names must be considered and hence the rules.

It probably never occurred to the framers of any of the Codes of Nomenclature that present day systematists would take advantage of these rules to save themselves trouble, and publish new names with just enough description to save their status under the rules; and yet this is precisely the situation that we face today in ornithology — and possibly in other branches of zoölogy and botany.

Hundreds of new birds have been named in recent years with diagnoses limited to one or two lines. These birds are not described, no one could identify them from the meagre diagnoses but in each case a type specimen and a type locality are cited and in that way the law is complied with and we are prevented from rejecting the name as unidentifiable! The author has another species to his credit, he or the institution he represents has another type specimen, but other ornithologists are put to the trouble

of borrowing his type or journeying to his collection to see it, before they can tell what he is talking about and the advance of ornithological science is impeded.

Usually a very little additional labor on the part of the author is all that is necessary to avoid all this trouble. Let us take a concrete example: A new form "b" is named and described as "similar to 'a' but larger" and a type specimen and locality are added. We have a specimen from another locality which is also "similar to 'a' but larger." We cannot tell whether it is identical with "b" or not. It may really differ more in size from "b" than the latter does from "a."

Now the describer of "b" must have measured both "b" and "a." If he did not his work is so careless that he had no right to describe the new form at all. If he *did* measure them it would be very little trouble to add the measurements to his diagnosis. When an author has decided that a form is new, nine-tenths of his work is done, and it is a duty he owes to science to complete the work by presenting all the data that governed him in naming it.

Some years ago a plea was circulated among scientific journals asking them to refuse to publish new genera unless a type species was designated. It would seem that some similar radical step must soon be taken with regard to these inadequately described new species and subspecies.

It is not necessary to draw up long verbose descriptions, often a few words embodying definite measurements and definite color values are all that are necessary, combined with a comparison with nearly allied forms.

If authors would realize that the advancement of science should stand ahead of the greed for names or types we should have no more of this inexcusable, slovenly work.

Let it be hoped that in future it will be generally recognized that an author who is guilty of such work invites a reputation for carelessness and inaccuracy and that a journal which lends itself to such publication lessens its dignity. There are comparatively few ornithologists who are offenders but they set a very bad example. Let us hope that they may realize the evil of this sort of work and that all ornithologists and editors will stand together in strenuous opposition to its continuance.

The Congo Expedition of the American Museum of Natural History has reached a most successful conclusion; and Mr. Herbert Lang, its leader, returned to New York on Nov. 12 last, after more than six years of uninterrupted work in the Congo Basin. His assistant, Mr. James P. Chapin, had preceded him by some 7 months. All their collections, in spite of the dangers and difficulties caused by the struggle in Europe, have arrived safely at the Museum; and it speaks well for conditions in the Belgian Congo that the party can boast of not having lost a single box of collections, even during the very long overland stages in the Congo, where not a few of them were carried for a distance of 50 days march.

This enterprise was carried on with the coöperation of the Belgian

Government, and a part of the zoölogical material is to be turned over to the Congo Museum at Tervueren.

Messrs. Lang and Chapin sailed for the Congo in May, 1909, and have collected across the entire breadth of the Belgian Congo. After ascending the river as far as Stanley Falls they continued eastward up into the great Ituri Forest, and then northward to the Upper Nile as far as the Lado Enclave and the Bahr-el-Ghazal.

Conditions of transportation necessitated returning by much the same route, and on the return journey much additional material was secured. The greater part of the time was thus spent in the northeastern part of the Congo, one of the most remote, most primitive, and most interesting portions of the continent.

The collections comprise not only magnificent representatives of the big game of the region, the Square-lipped Rhinoceros, the Okapi, the Derby Eland, the Bongo, and the Ituri Forest-Hog, but also extensive series of the mammals in general, birds, reptiles, amphibia and fishes, many thousands of invertebrates and a great deal of ethnological material, with numerous plaster-casts of faces from many different tribes, including the Pygmies. All this is supplemented by Mr. Lang's remarkable collection of photographs comprising some 7000 negatives.

The vertebrate specimens alone number some 20,000, but we shall only consider in detail the results of the work in ornithology. The specimens of birds collected number over 6200, representing — it is estimated — some 600 different species. They are accompanied by a collection of nests and eggs, and many interesting notes on food, habits, voice, and migration. These results will assuredly constitute an important addition to our knowledge of the avifauna of the Congo, and it is hoped that a general report on them will be published.

For the present, the new species discovered are being described in the 'Bulletin of the American Museum of Natural History'; among them is a very distinct new genus, Eeriocleptes, a Honey-Guide. The study of the bird collection has been entrusted to Mr. Chapin, junior member of the party, whose long field experience should prove extremely valuable.

Above all Messrs. Lang and Chapin were fortunate in maintaining themselves in good health for such a long period in a country justly famous for its disagreeable climate, insidious fevers, and sleeping sickness.

A NATURAL history survey of the Yosemite National Park is now absorbing the attention of several of the staff members of the California Museum of Vertebrate Zoölogy. In fact, during most of the past year, one or more representatives have been in the field, gathering specimens and information which will be used as basis of a scientific report and of a semi-popular account. Director Joseph Grinnell, Dr. Walter P. Taylor, Curator of Mammals, and Mr. Tracy I. Storer, Assistant Curator of Birds, are conjointly engaged in compiling the reports. They, with several student-assistants, have already been associated in the field-work.

The objects of the work have been to ascertain the nature and extent of the life-zones, and the life-history, systematic status, and inter-relationships of the constituent species of birds, mammals, reptiles, and amphibians. As regards the birds, many extensions of range have been established, as also some interesting habit-relationships.

MR. GEORGE K. CHERRIE one of the American Museum's representatives on Col. Roosevelt's Brazilian trip has for the past three months been engaged at the Museum in preparing for publication a report on the important collections of birds made by him while a member of that expedition. At the completion of that work the Museum plans to send Mr. Cherrie back to Brazil to investigate more thoroughly the bird-life of certain promising sections through which the Roosevelt party passed. This expedition will be made under the joint auspices of Col. Roosevelt and the Museum.

THE ACADEMY of Natural Sciences of Philadelphia has recently obtained the extensive collection of Guatemalan birds made by Messrs. Samuel N. Rhoads and Earl L. Poole on an expedition conducted by Mr. Rhoads during the early part of 1915. Mr. Rhoads is at present engaged in preparing a report on the collection.

FOR some years past it has been customary to provide numbered 'identification buttons' for members attending the A. O. U. Meetings. There has, however, been a demand for a more permanent A. O. U. badge which could be used at meetings in connection with a ribbon furnished by the local committee containing the identification number, etc.; or as an ornament suitable for wear at any time.

To meet this demand a blue and gold enamel pin has been specially designed as shown in the accompanying cut, which will be mailed postpaid to any Associate, Member, or Fellow of the A. O. U. for fifty cents (cost price).—Address DR. JONATHAN DWIGHT, 134 W. 71ST ST., NEW YORK CITY.

IN an obituary notice of Graf Hans von Berlepsch in the October Auk there was an unfortunate confusion with Baron Hans von Berlepsch. The latter is still living and it is he who has done so much for bird protection not the late Graf.

JUST as we go to press, we learn with sorrow of the death, at Cannes, on November 28, of Henry E. Dresser, one of the original Honorary Fellows of the A. O. U. A notice will appear in the April 'Auk'.